July 1, 1957

PAPER TRADE JOURNAL

- How Much Do You Know About Progress in Wet Strength?
- Up-to-Date Capacity Survey of All Paperboard Grades
- First Details of Heat & Chemical Recovery at Crofton
- New Look in Paper Roll Handling at O&M's Kenora Mill

Portrait in Pulp: THE GOTTESMAN ORGANIZATION. Age: 71.

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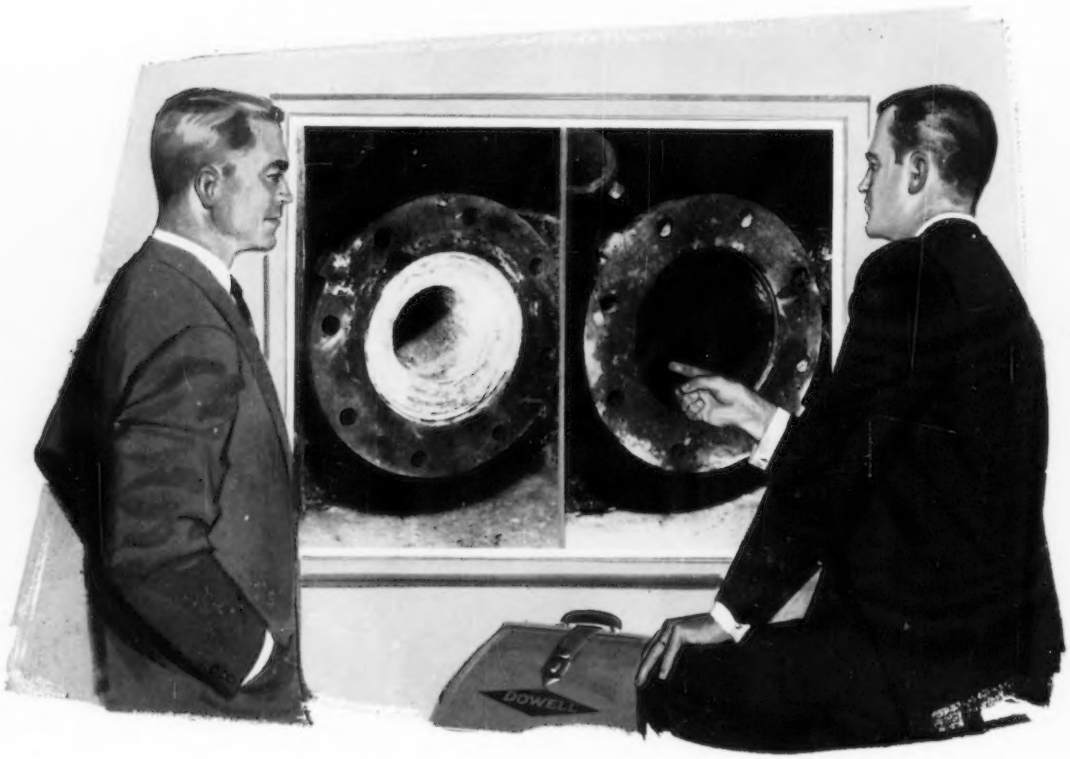

A few months before their peak season, the operators of this plant decided their main water line might not supply the water necessary to meet peak demands. The line was cast-iron, 16-inches in diameter and over 7,000 feet long. Its original flow efficiency or "C" factor had been 105; scale build-up had reduced this to 72. To lay an auxiliary line would cost at least $85,000.

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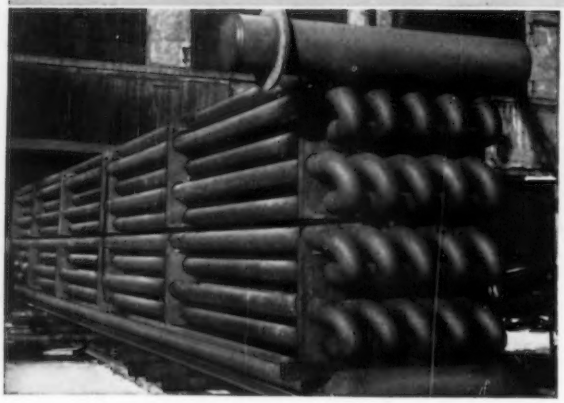

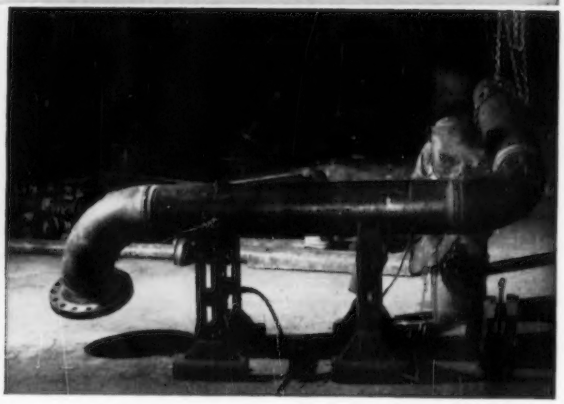

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TRENDS 11

NEWS BRIEFS

U. S. Plywood May Build Kraft Mill 15
Consolidated W.&P. Starts Biron Machine 16
Pulp, Paper and Board Supply—Demand 20

FEATURE ARTICLES

Survey of Paperboard Capacity By Grades 24
New Look in Roll Handling at O&M 32
How the Heat and Chemical Recovery Systems Were Engineered for Crofton 34
How Much Do You Know About Wet Strength Papers? 36

OBITUARIES 20
NEW LITERATURE 40
NEWS OF CONVERTERS. 42
PAPER PEOPLE 44
NEWS OF ASSOCIATIONS 47
PRICES OF MATERIALS. 48
PRICES OF FIBERS 49
NEWS OF SUPPLIERS .. 50
FIGURES OF THE WEEK 51
CLASSIFIED ADVERTISING 54
ADVERTISERS INDEX .. 58

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Food is a giant industry. In the short span of seventeen years, the national retail expenditures for food have jumped from $15 billion in 1939 to over $71 billion in 1956 . . . and they're still growing fast!

Obviously, in the processing of large volumes of food, factors such as efficiency, speed and economy play a spotlight role as they do in any large business. The best way to skin a potato, tomato, peach or pepper is vitally important. Versatile caustic soda provides the answer—again.

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This operation is not only speedy, but unlike manual or mechanical peeling, there is little, if any, loss of the fruit or vegetable.

Caustic soda is also used extensively in the production of chemicals, rayon and film, petroleum, pulp and paper, textiles, soap and cleansers, rubber, vegetable oils, metals and other goods. This "workhorse" is a basic Columbia-Southern product, as are chlorine, soda ash and related chemicals.

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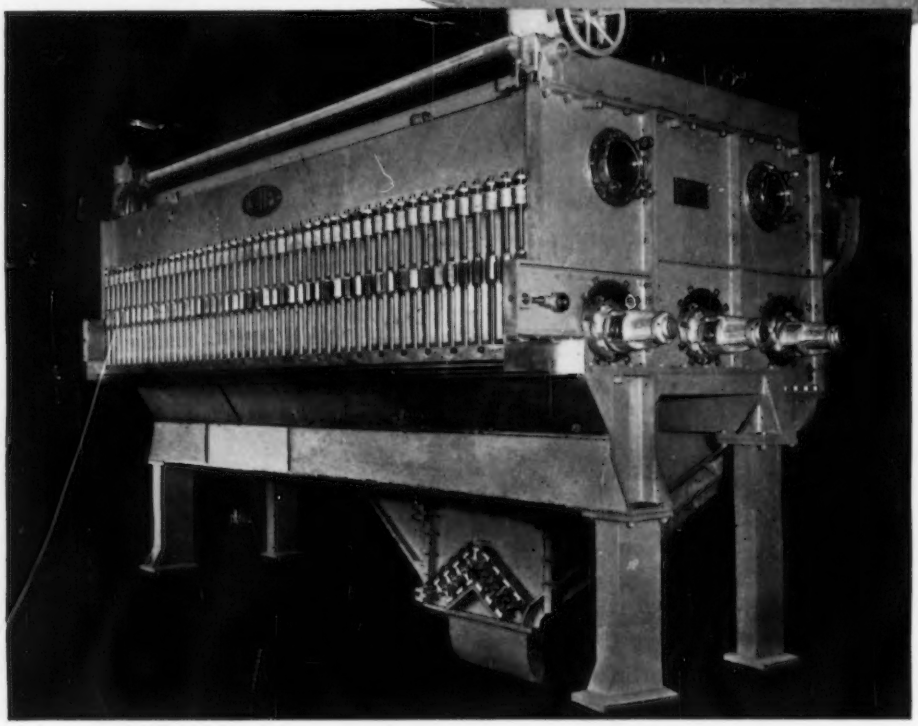
New AIRLOADED HEADBOX ...*by* VALLEY



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and
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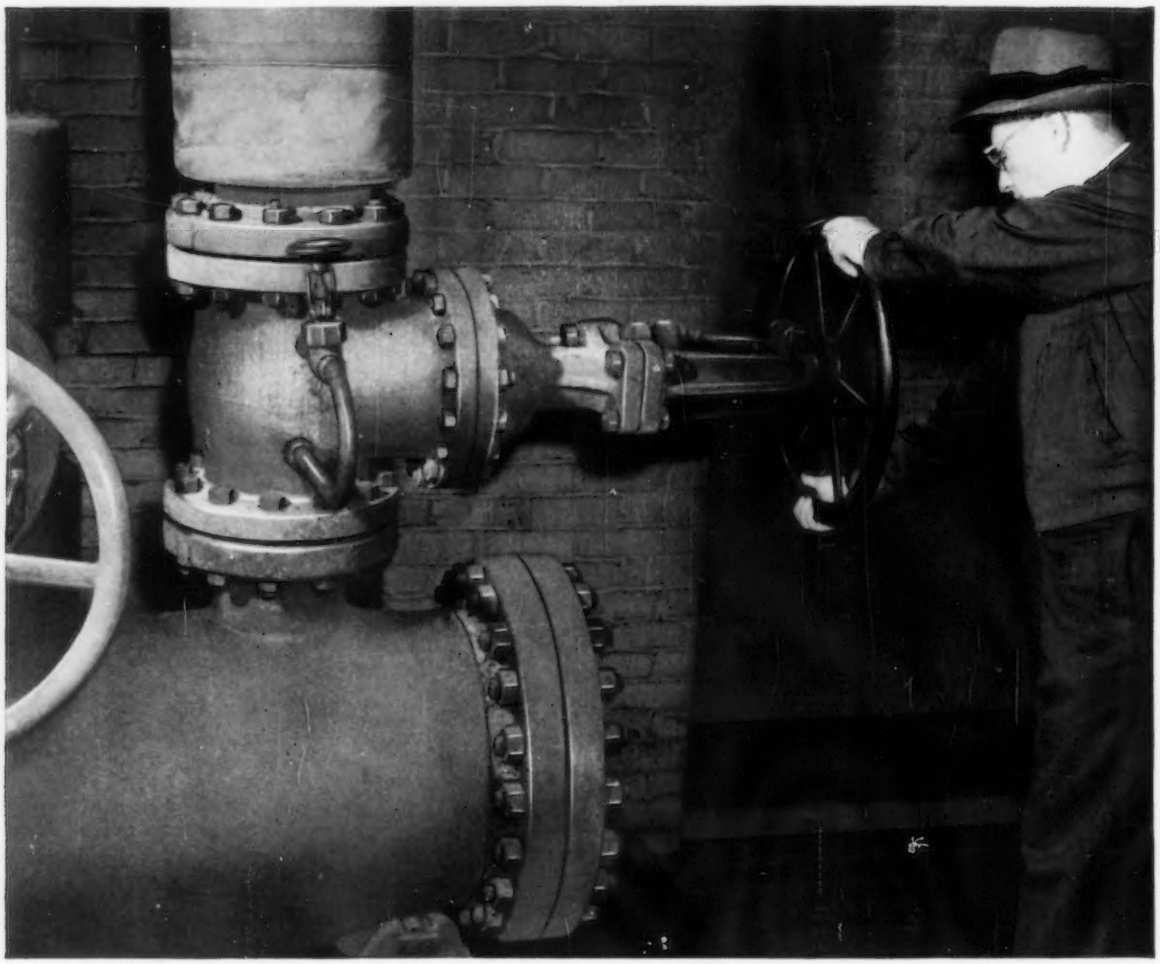
Another Case of Cost-Saving with Crane Steel Valves



This valve has a 28-year service record

Here is another prime example of Crane valve dependability—and what it means in dollars and cents to the user.

This Crane cast steel wedge gate valve has seen more than 28 years of service. It is installed in a line from the steam header in the plant of Scott Paper Company's West Coast Division, Everett, Wash. The 8-inch, 300-pound valve is operated 2 or 3 times a week. After almost 3 decades of hard, continuous service on 450°F. steam at 250 psi., this rugged, precision-built Crane valve still closes tightly and easily. Yet it has required only routine maintenance.

From the outside, Crane valves may resemble others. The big difference is on the inside—where Crane quality in design and construction, in precision machining and superior castings, assures the low-cost, trouble-free operation you want. Call your Crane Representative for expert assistance in specifying and ordering.

You may spot cost-saving ideas in this book of "Valve Performance Facts"—32 case histories throughout industry. Ask your Crane Representative or write for a copy.

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Paper and Board In April

Paper and board production during April amounted to 2,601,981 tons. This was 2% below the 2,644,827 tons produced in April a year ago. Paper production amounted to 1,168,711 tons, which was less than 1% above the 1,162,374 tons produced in April a year ago. The output of paperboard during this month was 1,180,512 tons, reflecting a 2% decrease under the production of 1,202,752 tons reported for April 1956.

Heat On Mergers

The recent Supreme Court ruling in the DuPont-General Motors case is reported to have strengthened the hand and determination of the Federal Trade Commission in fighting mergers. Among the mergers in our industry that are being fought or investigated are: Crown Zellerbach-St. Helens; International Paper-Long Bell; American Can-Dixie Cup; Mead-Atlanta; Weyerhaeuser-Eddy-Kieckhefer; Continental Can-Gair; and Owens Illinois-National Container.

Paperboard Capacity Report Out

The survey of paperboard capacity presented in this issue provides no startling information. It has been well realized within the industry that new paperboard capacity for all grades coming in during 1956, '57 and '58 will face a pretty well saturated market. The report does have value since it presents actual facts and figures on the subject. Also it may serve to deter uninformed or misinformed outsiders from jumping into production at this time.

Signs of Resistance To Labor Demands

Backbone stiffening by paper companies to union demands as previously predicted on this page, is now in evidence. In a few cases this has resulted in strikes (there are several on right now). Another factor contributing to the strikes and threats to strike may be the desire of the new merged union to make a showing in certain areas by obtaining additional benefits.

Pulp Off Fractionally

Wood pulp production during April amounted to 1,841,412 tons as compared to 1,859,477 tons produced in April a year ago. This represents a drop of less than one per cent.

Consumers Want More Capacity

An interesting sidelight on the Dept. of Commerce Paper and Board Capacity-Demand Report briefly discussed on page 20 of this issue was the reaction of certain consumer groups. Representatives of a number of paper consuming groups in consultation with the Dept. of Commerce, prior to publication of the report complained that the figures for future demand for the type of paper they use, were too low. Represented in the dissenting groups were: newspapers, consumer magazines and users of printing and fine papers.

Controlling Corrosion

Two separate long-range tests conducted by New England pulp manufacturer evaluate cathodic protection and the use of clad steel to lengthen life of soda mill digesters.

By Joseph H. Proctor, *Manager, Marketing Service*, Lukens Steel Company

The quality of its bleached pulp and the progressiveness of its engineering and production staff are widely recognized attributes of the old-line Penobscot Chemical Fibre Company of Great Works, Maine. Typical of its progressiveness is Penobscot's scientific battle against corrosion in its Soda Mill. There the cooking of some woods resulted in an extremely high corrosion rate of digester walls—actually measured at 0.230 inches per year for carbon steel.

Two anti-corrosion methods instituted by E. W. Keith, Penobscot vice president, have yielded a large measure of success. The first consisted of determining the feasibility of cathodically protecting a digester wall from the corrosive action of cooking liquors. The second involved replacing the most vulnerable area of the digester wall with Lukens Inconel-clad steel.

Cathodic Protection Effective

Numerous tests were made with the cathodic method, and an apparatus was devised which used an imposed D. C. source and sacrificial carbon steel electrodes. The system has now been studied and modified for over six years and a wealth of data accumulated. While engineers at Penobscot are extremely conservative in appraising the success of the system, corrosion rates have been markedly reduced. On the basis of this, plans are being made to expand its use.

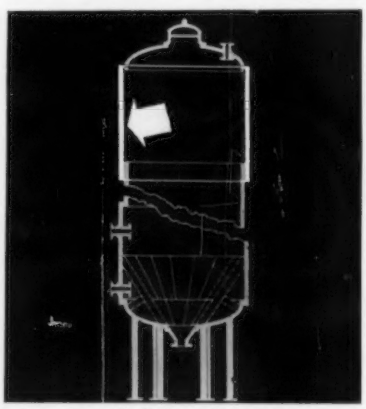
The second plan to halt soda mill digester corrosion involved the use of Inconel—an alloy consisting nominally of 77% nickel, 15% chromium, and 7% iron. It is highly resistant to alkaline pulping liquors. It was first applied as a seam and plug-welded lining to repair one of the digesters. While the metal itself stood up well, trouble was encountered with welds cracking and liquor getting between the lining and the steel shell. Entrapment of the liquor brought about bulging and progressive loosening of the liner and threatened caustic embrittlement of the shell.

Lukens Clad Steel

At the same time a decision was made to replace the upper course of another digester with Lukens Iconel-clad steel. Clad steel, unlike a lining, is a permanent metallurgical fusion of corrosion-resistant cladding material to a backing of carbon or low alloy steel which furnishes the needed vessel strength at considerably lower cost than solid high alloy. This is made possible because the full thickness of most clad steels meets A.S.M.E. requirements for the design of unfired pressure vessels.

No Measurable Wear in Six Years

The Inconel-clad course was fabricated and installed by the Portland Company, Portland, Maine, in July, 1951. In the area of normally most severe digester corrosion, it has shown absolutely no corrosion, erosion, or wear, either general or localized, as judged by both visual examination and audigage readings. Liquor entrapment, bulging, and caustic embrittlement are completely eliminated.



Lukens Inconel-clad steel installed in soda mill digester (see arrow) shows absolutely no wear after six years.

It is another example of effective control of corrosion with clad steel in paper industry equipment. Besides extending the service life of digesters, clad steel has raised operating efficiency and lowered maintenance costs in head boxes, beater tubs, and blow pits. In each such application, the combination of cladding and backing can be tailored to meet specific needs.

The use of Lukens clad steel to meet corrosion problems similar to those of the pulp and paper industry is growing rapidly in other industries. Soap makers have reported highly successful handling of corrosive fatty acids with clad steel equipment. Petroleum refiners whose reactors, vessels, and other equipment call for a wide variety of gages, surfaces, strength, to handle corrosive materials at temperatures up to and above 800 deg. F., have become major users of versatile Lukens clad steels.

Clad Steel Data on Request

Information about the many uses of clad steel, its workability, varieties, characteristics, and application to any specific problem can be obtained from the **Manager, Marketing Service, 953 Lukens Building, Lukens Steel Company, Coatesville, Pa.** This company is the oldest and largest producer of clad and alloy steel plate in the world and will gladly provide you the benefit of its experience in producing steels for the paper industry. If you're interested, write for the 28-page bulletin, "Clad Steel Equipment."

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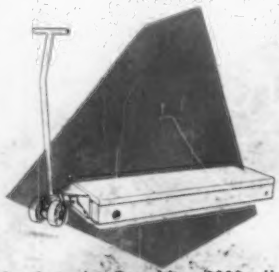
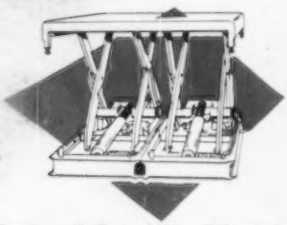
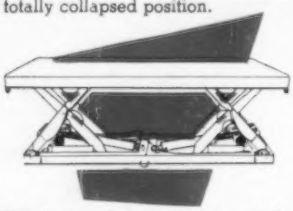


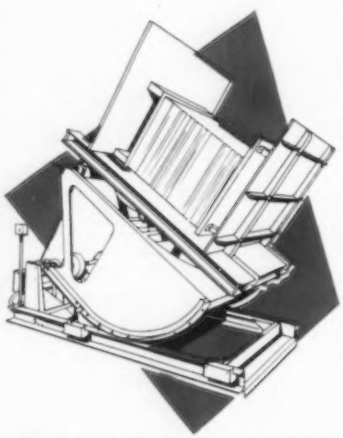
Southworth Portable 2000 lb. Lift Table shown collapsed with dolly. Can be used to shift light loads on short hauls. No installation cost. Simply plug it in.



Southworth Twin (48" x 53" min.) Lift Tables available in varying capacities up to 16,000 lbs. Hinged platform makes servicing easy in totally collapsed position.



Southworth Tandem (24" x 106" min.) Lift Table available also in capacities up to 16,000 lbs. Note entirely self-contained pump assembly and working parts.



Southworth Skid-Turner turns full skid of material in less than three minutes. One man operated. Push button control. Capacity 5,000 lbs.

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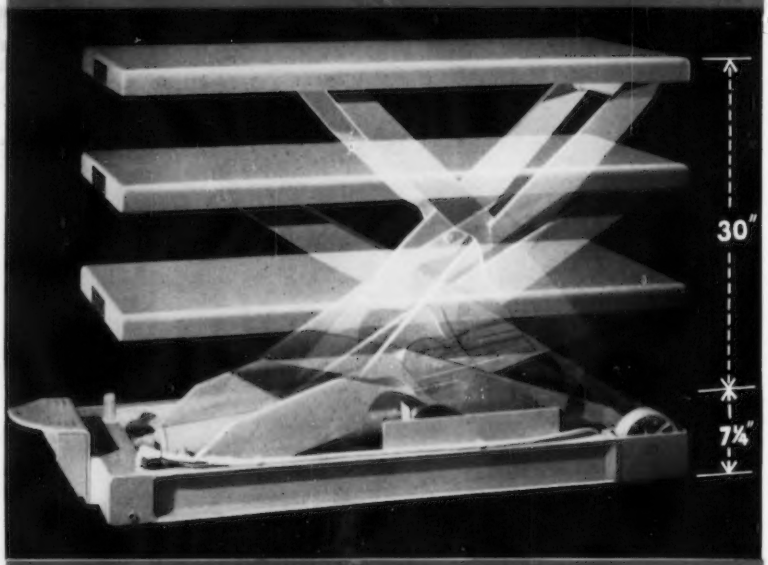

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U. S. Plywood Considers Calif. Kraft Mill

A California water pollution control board has been asked to establish standards for dumping affluent from a proposed large paper pulp mill into the Sacramento River at Anderson in Shasta County.

The plant would be operated in connection with the present wood products plant of Shasta Plywood Division, United States Plywood Corp.

K. L. Morrow, general manager of the Anderson plant reports that plans have not reached the stage of designating the size, amount of investment, or number of employes.

He added that a kraft pulp and paper mill with a daily capacity of 400 tons per day is being considered.

A pollution control board meeting in Sacramento was to sound out other state agencies on possible standards that would not degrade the quality of the river water.

Potlatch Installs Oxidation Method of Kraft Odor Control

Oxidation equipment to reduce odors from the kraft pulp mill of Potlatch Forests, Inc., has been in operation for about one month.

The equipment towers, which oxidize odors from gases relieved in the recovery process, are reported to be operating satisfactorily under normal operating conditions.

The towers selected by Potlach for installation at its Lewiston, Idaho plant, were developed by the British Columbia Research Council and are the first to be installed in the United States. They work on a principle of counterflow of air directed against the flow of black liquor from the recovery process, which oxidizes many of the odorous components, transforming them to non-odoriferous elements.

A detailed report of this odor control system as it operates at the pulp mill of MacMillan & Bloedel, Port Alberni, B. C., ran in *Paper Trade Journal*, October 10, 1955.

To Make Paper From Cotton Stalks

A 3½ million dollar plant at Buttonwillow, Calif., for the conversion of cotton stalks into paper will go into operation on an experimental basis this fall and on a production basis a year from this fall, John S. Stohr and Lawson H. Linde, entrepreneurs, announce.

Using a process developed by Mr. Linde, the Kerncot Fiber Corp. leased the old Pacific Gas & Electric Co. steam plant at Buttonwillow as a site for operations. Clifton Clemens will handle harvesting and R. Whittemore will be plant manager. Mr. Clemens has been active in developing a cotton stalk harvester over a long period of time and has made highly specialized machinery for use in harvesting cotton plants, roots and all.

Details of the pulping process are not available but it would appear to be a caustic cook. No information is available either about the type of paper to be made.

Perkins-Goodwin Buys Into Sanitary Paper Mills

Raymond C. Comins, president of Sanitary Paper Mills, Inc., East Hartford, Conn., manufacturers of Dovalettes facial tissue and Doval facial type toilet tissue, announces that Perkins-Goodwin Co. has purchased a minority common stock interest in the mill and will participate in the management, effective July 1.

Hamersley Modernizes Garfield Mill

An extensive modernization program at Hamersley Mfg. Co. in Garfield, N. J., has been completed. All water pipe in the mill has been replaced with new Transite piping and Transite and stainless steel pipe now handle all stock.

The beaters and tiled chests have been rebuilt and improved, and new stuff pumps have been installed. Another new feature is automatic control of stock consistency.

The whole system is designed to give better blending of furnishes, color control and uniformity in delivering cleaner fiber to the paper machines.

Italian Mill Uses New Pulping System

An important Sprout-Waldron 36-2 refiner installation is located in Italy in connection with a continuous cold caustic impregnation and treatment system. This Italian mill will produce sanitary tissues from poplar wood. The mill, which is about to go into production, is said to be the first continuous cold caustic semichemical pulping system in the world.

In addition to this one installation, Sprout-Waldron is also making two installations in Tasmania, Australia this year which will process eucalyptus chips with a cold caustic treatment to produce pulp for various papers. In one mill the output will be used entirely in newspaper manufacture while in the other, the pulp will be bleached and used for various grades of paper.

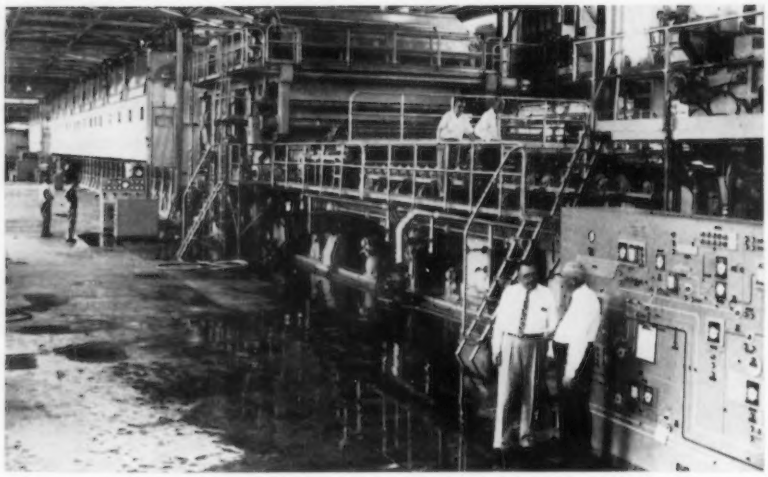
Strikes—Short and Long, Cropping Up Recently

Strikes and threats of strikes have taken shape in different quarters of the industry lately: The major walk-out at Hammermill Paper Co., first reported last week, was still in force at press time this week.

Probably the longest strike still going is the seven-week contract dispute at Hudson Pulp & Paper Co.'s bag plant in Wellsburg, W. Va.

A one-day wildcat walk-out came and went June 20 at the Oswego, N. Y. mill of Marathon Corp.

Brown Co. recently averted a papermakers' strike, but 700 woodsmen did go out.



Consolidated W. & P. Starts New Machine

A new high-speed enamel paper machine was put into operation June 31 at the Biron Division of Consolidated Water Power & Paper Co., climaxing a twenty-month construction program costing $15 million.

Now operating at 1,400 f.p.m., the machine is designed and balanced to produce a sheet of paper 184 in. wide at speeds of over 2,000 f.p.m. Stanton W. Mead, company president stated: "Our new paper machine will increase our production of enamel papers by 60,000 tons annually and marks our tenth papermaking unit devoted exclusively to the manufacture of this paper. It expresses our confidence in the stability and growth of commercial and publication printing."

The Machine

Outstanding among the features on the machine is a suction pickup. (The company has had a like unit in operation on another enamel paper machine at Biron which enables it to operate at speeds up to 1,750 f.p.m., setting a new world speed record for the production of book papers.) Other machine features include pressure headbox, Consolidated coater, continuous broke system, enclosed hood, semi-automatic weighing of rolls by strain gauge scale while in transfer from machine to supercalenders, and new type winder to handle 88 in. diameter reels. The machine was built by Beloit Iron Works.

New Power Plant

Included in the project is a new boiler and steam turbine plant which will boost the company's generating capacity by over 15,000 kws. per hour. Heart of this plant addition is a 1,450-lb. boiler which is reported to be one of the highest pressure boilers in the paper industry. Operation of this unit is scheduled for August.

Wood Equipment

A new 9 x 120 ft. hot pond was built to handle 100 in. spruce and poplar for groundwood. The pond is 12 ft. deep. Included in this new facility is a new jack ladder to the woodroom equipped with hydraulic slasher saws. The only addition to existing two-drum woodroom is a new blade-type hydraulically-operated wood splitter for large diameter logs.

A new automatic system of chain and belt type conveyors was installed to move poplar pulpwood from the woodroom to mechanical pulp department via a new wet storage tank. Semichemical and sulphite pulp requirements are produced by Consolidated's Wisconsin Rapids Division at Wisconsin Rapids and slushed to Biron Division via existing underground pipeline.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of the United States production to mill capacity for the week ending June 15, 1957, was 94.1 percent, compared with 93.4 percent, revised for the preceding week. The ratio was 100.1 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paper board production ratio for the week ending June 15, 1957 was 94 percent, compared with 86 percent for the preceding week and 99 percent for the corresponding week last year.

(Detailed statistics on page 51.)

Groundwood Capacity Doubled

Groundwood capacity has been increased from 100 to 200 tons daily at the Biron plant by the addition of three new continuous ring-type grinders and the conversion of two existing grinders from 33 in. to 50 in. wood. Expanded bleaching facilities, which include a new continuous, medium consistency (18 per cent) bleaching tower, are housed in a new 11,000 sq. ft. steel and aluminum building addition to the bleach plant.

First Bulk Starch System

The industry's first bulk starch handling system (described in Paper Trade Journal, June 3, 1957) which is expected to reflect a substantial cost savings over conventional packaged starch has been incorporated to serve the entire plant. This system combines pneumatic and mechanical conveying of starch and clay from railroad cars to five bulk storage silos and to the coating preparation department.

Stock Metering and Supercalenders

A new automatic stock metering and proportioning system will blend and meter up to five different pulps. This system serves new No. 5 machine as well as three existing enamel paper machines.

Two new supercalenders have been installed to finish paper from the new machine. These units are loaded on the machine floor and operated on the ground floor to facilitate handling.

Water System Doubled

To meet water requirements for expanded production, both raw water and filter plant capacity was increased from six million to twelve million gallons per day. Included in this installation are new raw water filters, accelator, and two new filter beds.

Continuous Coating Preparation

A continuous coating makedown system has been incorporated in the coating preparation department to serve No. 5 machine and three existing enamel paper machines.

Engineering and Construction

Major engineering of the entire expansion program was conducted by the company's engineering staff. Consulting engineering services included Pioneer Engineering Co. for the boiler and steam turbine plant and Central States Engineering Co. for certain phases of the woodroom and groundwood department expansion.

Dierks to Commence Operations Mid-Summer

Dierks Paper Co., is expected to begin operations sometime late this summer at Pine Bluff, Ark. Installation of the Black-Clawson paper machine should be completed during the next several weeks. The 166-inch machine, is designed to produce 150 tons per day of kraft paper and board at speeds from 200 to 1500 f.p.m.

This mill comprising five buildings is being constructed on a 1480-acre site along the Arkansas River at a total cost of $15 million. Nineteen miles of new rail were laid to connect the Missouri Pacific and De Queen & Eastern railways to transport wood chips to the paper mill. These chips are a by-product of Dierks saw mill operations. Dierks Forests, Inc., the parent lumber company owns approximately 1½ million acres of timber throughout Oklahoma and Arkansas.

The paper machine, of the permanent cantilever fourdrinier type with an open headbox features a dual box suction couch mounted as an integral part of the cantilever mechanism to provide for a quick wire change. The press section will have two suction presses and one smooth press preceding the dryer section. Three sections of a 60-inch double-deck dryer, a breaker stack between the first and second dryer section, a size press between the second and third dryer sections, two calender stacks, and an Autoflyte reel will comprise the balance of the machine. The machine from couch to reel will be driven through eleven Black-Clawson heavy duty spiral bevel gear drives.

The new mill was designed by Rust Engineering Co. of Pittsburgh.

700 Lumberjacks Of Brown Co. Strike

Approximately 700 lumberjacks employed by Brown Co. went on strike June 21 in a demand for a union shop and a 20 per cent wage boost.

The strikers quit work in the Parmachenee area of Maine. A company statement said the strike does not affect employes of any of the Brown Co. plants in Berlin, Gorham and North Stratford, N. H.

Philip Smyth, international representative of the United Northeastern Woodworkers of America, said all the strikers are members of that union. This was disputed by C. S. Herr, a vice president of the pulp and paper firm, who declared only 360 of the 700 are union members.

Mr. Herr said the strike was ordered because of the company's refusal to grant recognition of the union shop which he termed "the real issue."

Want To Be An Editor?

We are expanding our editorial staff and have several openings for assistant or associate editors. Applicants should have a knowledge of pulp and paper manufacturing or converting operations and a genuine interest in the industry. We will be happy to receive applications from interested individuals. All replies will be held confidential. The Editor.

Pacific Negotiators Agree on Wage Boost

Terms of an agreement being voted on by 20,000 pulp and paper mill employes in Oregon, Washington and California have been revealed in a joint union-management release.

Negotiators have agreed on a pay boost of 5½ cents to 15 cents an hour, retroactive to June 1; a third week of vacation pay for employes with ten years' service, starting June 1, 1958; and increased company contributions to health and welfare to bring employer payments up to 80 percent of the basic cost.

Results of the referendum being voted by 56 locals in 45 plants were not available at press time.

The terms were reached last week by negotiators for the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, the United Papermakers and Paperworkers and the Pacific Coast Assn. of Pulp and Paper Manufacturers.

The new contract, if approved, will boost the hourly base rate for men to $2.01, an increase of 7 cents an hour. For women, the base rate becomes $1.70, a 5½ cent boost. Journeymen mechanics will get $2.72½ an hour, a 9½ cent increase.

The joint union-employer statement said the increases would continue to keep pulp and paper wage rates on the Pacific coast the highest in the nation.

Another Scott Foundation Scholarship Award

Scott Paper Co. Foundation Award at Swarthmore College will go this year to William Poole, Jr., a sophomore economics major. The award consists of $1,000 for each of his last two college years. Under the award program, Swarthmore College will receive $1,000 each year an award is in effect.

Award recipients are chosen by a College - Student - Faculty committee. Previous winners were Henry Bode '55, Larry Shane '56, Tom Glennan '57, and John Hawley '58.

Tests Prove Lignosol Prevents Frost Heave

Along 34 stretches of road which heaved each spring, Canadian National Railway section gangs injected lignosol, sulphite waste liquor, at six foot intervals over a period of three years.

Using a jack hammer, they first drove injection pipes four to five ft. into the ground, just outside the ties.

The depth was adjusted so the treatment would be applied between the frost line and the ground water level, and lignosol was pumped into each of the pipes until it broke through to the surface of the roadbed.

The result: Substantial cost savings in the majority of cases. General savings are estimated at several times the initial cost of the lignosol treatment.

"We have now proved conclusively that railway roadbeds treated in this way are much less susceptible to frost heaving," President F. T. Atkinson of Lignosol Chemicals Ltd., jointly owned by Anglo-Newfoundland Development Co. and Anglo-Canadian Pulp & Paper Co. told Canada's newsmen.

"In some cases the heaving can be eliminated entirely, and in others it can be drastically reduced."

June 19, 1957

Mr. A. M. Hurter
c/o Stadler, Hurter and Company
Montreal 2, Quebec

Dear Mr. Hurter:

I noticed with interest, your letter to the Paper Trade Journal in the June 10 issue (page 32). I think your remarks are well taken and you are absolutely right that there are plenty of very large Yankee dryers in Europe; in fact, I have seen dryers which were just under 20 feet. I imagine, however, that the 16 ft. diameter Yankee is the largest one on this side of the Atlantic.

When we talk about large dryers, are we talking about the diameter, or the diameter and face; this brings to mind the Yankee which we have recently furnished Thilmany Pulp and Paper Co.—a 15 ft. by 170" face Yankee for high finish MG papers, for which Thilmany is very famous. So from this, I don't know whether the Pacific Coast Paper Mills' or Thilmany's is the largest Yankee on this side of the Atlantic. The Thilmany dryer weighed 70 tons.

With kind regards,

Yours sincerely,
Cliff R. Crawford, Pres.
Black-Clawson Co.
Hamilton, Ohio

Francis Blake receives scholarship from Charles W. Howarth (second from left), president and treasurer of Columbia Box Board Mills, Inc., Chatham, N. Y. Others at the event were (left to right): Robert R. Howarth, Columbia's executive vice president; Miss Marion Bernhoft, guidance director at New Lebanon Central School; Walter B. Howard, school prinicpal; and Cecil S. Mapes, superintendent of schools for the 1st District of Columbia County.

Receives Columbia Box Board Scholarship

The first winner of the Columbia Box Board Mills Foundation scholarship has been selected. He is Francis Blake of Canaan, N. Y., and the New Lebanon Central School.

The foundation has been established by Columbia Box Board Mills, Inc., Chatham, N. Y. It provides a total of $3,000 to help pay tuition for the pulp and paper course of the School of Technology at the University of Maine. The scholarship pays $1,000 each year for the first two years and $500 each year for the last two years.

The alternate winner is Alan Judson of Niverville, N. Y., and the Ichabod Crane Central School. Two other students reached the final stage of the competition. They are Peter Gowan of Kinderhook and Ichabod Crane Central School and Frank Traver of Catham and Chatham Central School.

The award climaxes a year of intensive work to interest young men in a career in the pulp and paper industry. Films were shown and talks delivered at schools in Columbia's area (Catham Union, Ockawamick, Ichabod Crane and New Lebanon Central).

Before the winner was selected the four finalists attended the Pulp and Paper Foundation's Annual open house at the University of Maine. They witnessed demonstrations and research projects and sat in on a forum between students and executives of the pulp and paper industry. They also were interviewed by members of the University's faculty.

Next year students at schools in the Walloomsac area will also be eligible for the scholarship.

Lower Mich. Peninsula Pulpwood Use to Double by 1960

Consumption of Lower Peninsula pulpwood will more than double by 1960, according to a report prepared for the Michigan Forest Industries Information Committee by G. B. Bonfield, committee chairman and vice-president of American Box Board Co.

The report, which summarized Lower Peninsula pulpwood use, said 1956 consumption of pulpwood by six mills was 296,000 cords. By 1960, nine mills will consume 704,000 cords, it estimated. This includes two mills using pulpwood to manufacture hardboard and excelsior. The 138 per cent increase forecast represents a jump in the use of aspen and other hardwoods from 258,000 cords in 1956 to an estimated 481,000 in 1960, and an increase in pine use from 28,000 to 198,000 cords.

Balsam fir and spruce consumption will increase only slightly from the present 10,000 cords to 25,000 cords by 1960, according to the Bonfield report. All pulp mills contacted use aspen and other hardwoods now and will increase their consumption of these pulpwood types by 1960, as well as the three new mills, the report said. Only one mill at present uses balsam fir and spruce, and no others plan use of these woods by 1960. Pine pulpwood is presently being used by only one mill, at Muskegon, but mills at Filer City and Alpena plan use of pine by 1960.

"Michigan forests can produce the wood we need, but it will be a challenge for everyone concerned," said Mr. Bonfield. "Much of our fast-growing aspen forest is presently in need of harvesting if it is to remain productive for the future."

Oregon Wood Waste Survey Completed

The Vancouver consulting engineering firm of Sandwell & Co. has released the results and findings of a forest industries survey it recently completed for the State of Oregon.

The Sandwell report, besides blueprinting a plan for utilization of wood waste, also follows through with specific courses of action which, according to the chairman of the Oregon Development Commission, Joseph W. Smith, "already have begun to bear fruit."

Oregon, with more acres of commercial forest land than any other state in the Union, has set the wheels in motion to bring about greater utilization of its wood residue by undertaking research and development studies of value to potential users such as wood composition board and pulp and paper manufacturers.

Sandwell engineers in their report estimate that the potential raw material supply is approximately 900,000 bone dry tons per annum of wood chips, corresponding to 450,000 air dry tons per annum of chemical fiber for paper making. The firm found three areas in the State which are particularly suitable for the establishment of wood composition board industries and picked nine other sites which all had basic factors conducive to the establishment of pulp and paper industries.

The information will be compiled in report form and made available to prospective wood residue using industries.

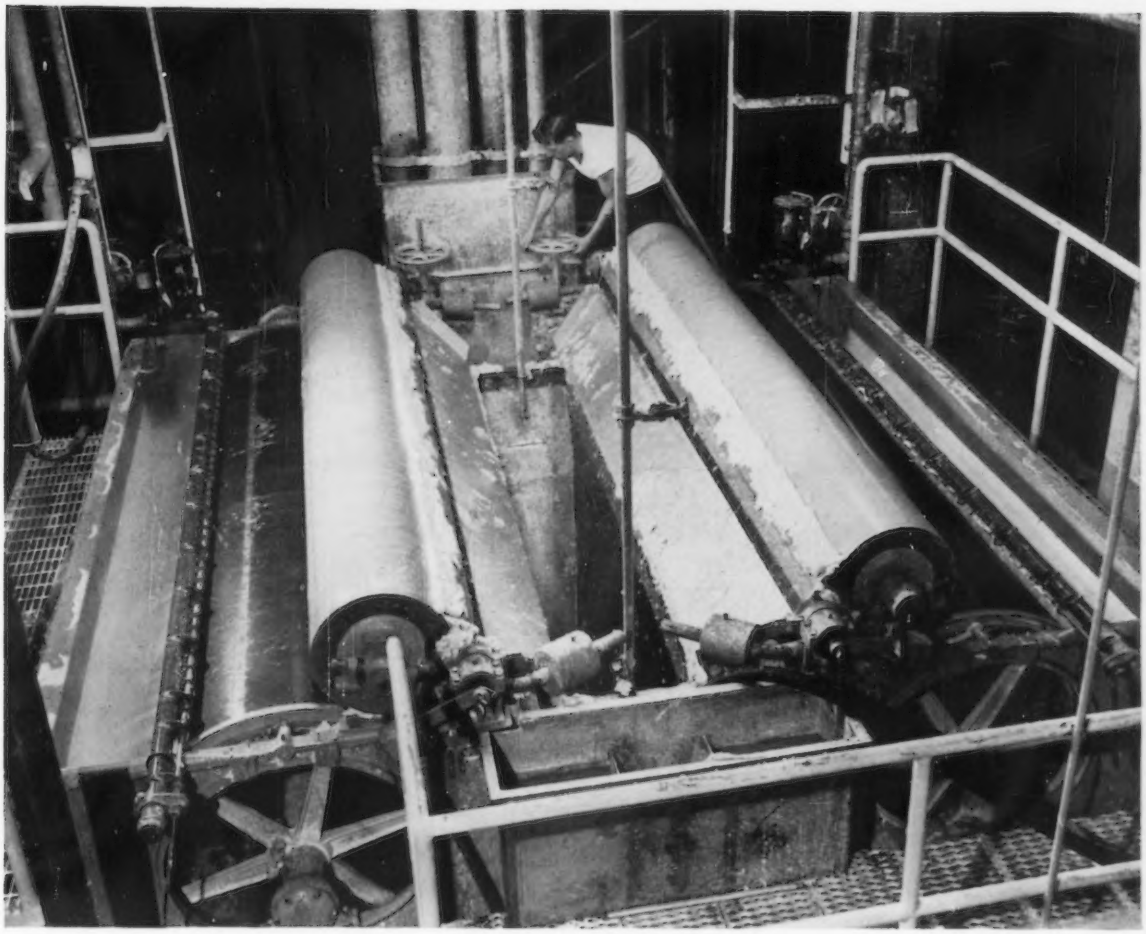
"A number of companies in the specific fields of wood composition board and pulp manufacturing already have indicated their desire to receive these reports," Chairman Smith reports.

Consolidated Breaks Ground for L. A. Plant

Consolidated Paper Manufacturing Co. recently conducted ground-breaking ceremonies for its new million dollar plant.

Al Melnick, general sales manager for the Los Angeles concern, turned the first shovelful of earth. He said the one-story, 100,000-sq.-ft. building is expected to be in operation about September 1.

The company, now located across the street at 2845 E. 26th St., manufactures paper napkins and tissue products.



This Stock Is Going into Paper and Profit Instead of Going Down the Drain

When you see good papermaking fibres coming off the couch roll of a Bird Save-All, it's like watching good paper dollars being made before your eyes.

For this is stock that has been put through expensive processing . . . is finally ready to be made into salable paper . . . and but for the Save-All would be going down the drain.

Simple gravity is the separating force. A single motor (2 HP on the 3 smaller sizes, 3 HP on the large unit) is all it takes. No vacuum, no chemicals, no storage problem. Wash-ups are easy, quick and thorough. Installation, operating and maintenance costs are low.

Estimates of net savings can be worked out for you before you make the investment in recovery equipment. Let us show you how substantial they might be.

BIRD
MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

Pulp, Paper and Board Supply-Demand

The long awaited Department of Commerce, "Pulp, Paper and Board Supply-Demand" report has just been issued.

Since this publication contains 218 pages of text and charts it was not possible for us to study and comment on it in time for this issue. We therefore restrict ourselves here to publication of the "Summary" as it appears in the early pages in the report. We hope later to publish more details from the report, together with comments from industry experts.

Paper and Board Demand

In 1965 the estimated United States net demand for paper and board will total 43,800,000 tons, an increase of 40 per cent over 1956 production of 31,336,000 tons. Increases in expected 1965 net demand by grade groups of paper and board, compared with 1956, are expected to vary. Actual United States paper and board production for 1955 and 1956 as compared with net demand for 1958 and 1960 is also shown.

Paper and Board Capacity

On the indicated maximum basis, total United States committed paper and board annual capacity should reach 39,700,000 tons in 1959, compared with the corresponding 1956 capacity of 34,095,000 tons, an increase of 16.5 per cent. On the historical basis, 1959 committed annual capacity would be 37 million tons, an increase of 16 per cent over the corresponding 1956 capacity.

For 1958, United States paper and board committed capacity is expected to total 38,800,000 tons on the indicated maximum basis, or 36,100,000 tons on the historical basis, compared with net demand (required production) of 34 million tons.

On the indicated maximum capacity basis, the ratio of estimated production (net demand) to capacity would be 87.6. In 1955 and most of 1956 when a very strong demand existed for the products of the United States paper and board industry the comparable ratios of production to capacity were 92.7 in 1955 and 91.9 in 1956.

Using the historical capacity basis, the 1958 ratio of estimated production (net demand) to capacity would be 94.2 as compared with 98.7 in 1955 and 98.2 in 1956.

Newsprint

World newsprint demand in 1959 is expected to total 14,900,000 tons compared with a production potential of 16,300,000 tons. Beginning in 1957 there is expected to be a growing cushion of supply in excess of world demand.

United States newsprint consumption demand is expected to rise to 8,250,000 tons in 1965, compared with 6,800,000 tons in 1956, a gain of 21.3 per cent. For 1957, 1958, and 1959 a growing margin of supply over demand is indicated. During these 3 years United States newsprint capacity increases are expected to more than meet the growth in domestic demand, with the result that newsprint imports into the United States may decline in this period.

Woodpulp Demand

Net demand for wood pulp produced in the United States in 1965 is estimated to total 32,400,000 tons, an increase of 46.5 per cent compared with production of 22,121,000 tons in 1956. Increases expected in 1965 net demand for wood pulp as compared with 1956 vary according to grade group.

Woodpulp Capacity

Domestic wood pulp production capacity is expected to total 28,900,000 tons in 1959, an increase of 19.4 per cent over 1956 capacity of 24,198,000 tons.

For 1958, United States wood pulp capacity is expected to total 28,200,000 tons compared with the net demand of 23,900,000 tons on the growth - trend basis. The ratio of production to capacity in 1958 would be 84.8. In 1955 and 1956, when a heavy demand existed for United States produced wood pulp, the production ratios to full capacity were 92.6 in 1955 and 91.4 in 1956.

Woodpulp Consumption

United States total woodpulp consumption in paper and board manufacture and in nonpaper uses for 1965 is estimated at 34 million tons, an increase of 42 per cent over actual 1956 consumption of 23,839,000 tons. Paper-grade wood pulp consumption for 1965 is shown at 32,300,000 tons, a gain of 40.3 per cent over 1956; dissolving wood pulp for 1965 is estimated at 1,700,000 tons, an increase of 81.6 per cent over 1956.

Pulpwood

Consumption of pulpwood by the pulp industry is estimated to total 52,-800,000 cords in 1965, a gain of 47 per cent over the 35,755,000 cords used in 1956.

Wastepaper

Wastepaper consumption by 1965 is expected to total 11,600,000 tons, a gain of 31 per cent over the 8,861,000 tons used in 1956. Consumption of other fibrous material in 1965 is estimated at 1,700,000 tons compared with 1,263,000 tons in 1956, an increase of 34 per cent.

Timber Supply

With present trends in forestry, existing supplies of standing timber in the United States plus prospective growth appear adequate to supply increased demands for pulp and paper.

OBITUARIES

Vincent Schnorberger, 34, died in his home at Monroe, Mich., June 14. He was a retired engineer at the Consolidated Paper Co., where he had been employed for 30 years.

Charles J. Guenther, 79, New England sales engineer for Stickle Steam Specialties Co., Indianapolis, Ind. since 1912 passed away unexpectedly at his home in Leominster, Mass. on June 15.

Prior to taking over the position as sales engineer for the Stickle organization in New England he was draftsman for four years at the Indianapolis office.

Ernest B. Brown, 51, general manager of Whakatane Board Mills Ltd., New Zealand, died on May 25.

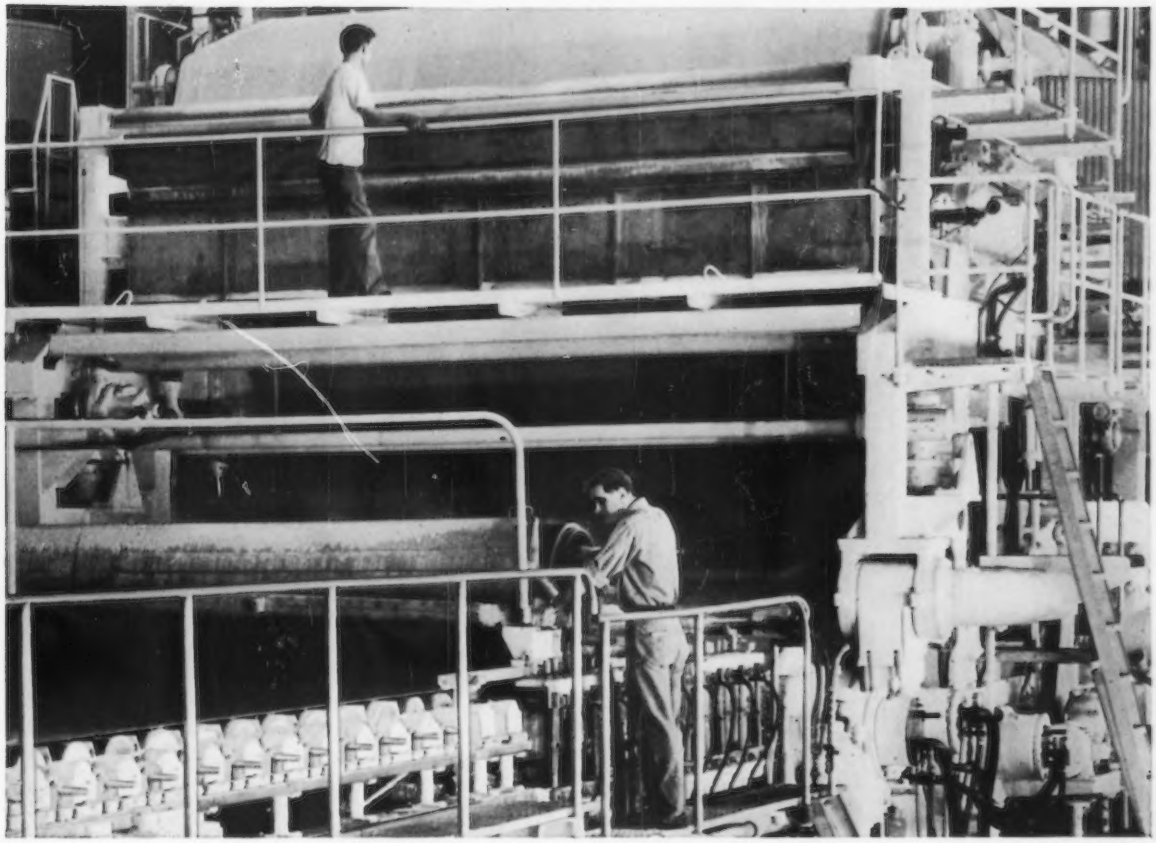
Associated with the company for 27 years, Mr. Brown succeeded the late Henry Horrocks, founder of the Mill, who died in 1942.

George W. Clarke, 83, president of Clarke Paper Co., Wheeling, W. Va., died June 13.

I. W. Reynolds, 77, vice-president of Foxboro Co., died of a heart attack early in June. He specialized in the production of Foxboro instruments.

Albert F. Piepenberg, 77, retired superintendent of Combined Locks Paper Co., died recently at his home in Combined Locks, Wis.

C.P. Starches...Try 'em for Size



FOR COATING ADHESIVES USE Ten-o-film® STARCHES

Are you getting the kind of performance you want from your coating adhesives? Do they have satisfactory viscosity stability at high solids—and give good adhesive performance at lower adhesive concentrations?

For a real solution to such problems, it will pay you to investigate the new, improved Ten-O-Film starches.

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Cleaner halftones on paper finished with "AVITONE"* A LUBRICANT

One of the largest consumer magazines in the United States has recently selected book papers finished with "AVITONE" A for all its black and white printing. In the opinion of this magazine, halftones printed on this paper were cleaner and held the subtle gray shadings so important in reproduction.

"AVITONE" A acts as a lubricant and plasticizer in starch-clay coatings applied by machine coating methods. The coated sheets have a higher finish, greater flexibility and a "slicker" feel. Printers report that papers coated with "AVITONE" A mixed in the starch-clay formulation save them money by reducing abrasion on printing plates, giving them more impressions per plate.

"AVITONE" A offers additional advantages for your mill operation. It has a cleaning and polishing effect on the surfaces of dryer cylinders, calender and supercalender rolls, giving paper a smoother finish. For additional information on "AVITONE" A, just write: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes and Chemicals Division, Wilmington 98, Delaware.

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Better Things for Better Living . . . *through Chemistry*

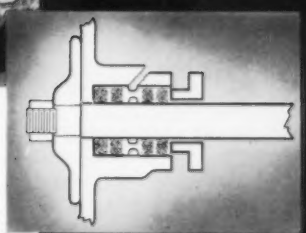
MORE OF

THE GARLOCK 2,000

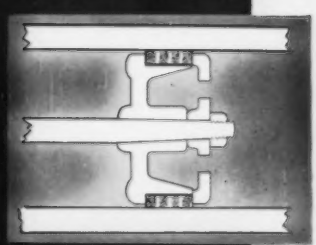
LATTICE-BRAID Packings of pure Teflon fiber for rotating shafts at high peripheral speeds . . . tough, chemically inert, yet resilient for positive sealing and cooler operation under extreme temperature and chemical exposure.

LATTICE-BRAID Asbestos Packing with Teflon impregnation, reduces friction, provides better seal with less gland pressure.

Wherever corrosion, contamination or torque is a problem on reciprocating applications or slow-turning valves CHEVRON† Packing made of Teflon is recommended.



Centrifugal pumps handling hot sulfuric acid and petroleum fractions leaked badly with ordinary packing. Also, new shaft sleeve required every few days. Teflon packing reduced leakage, and after several months service both packing and shaft were still in good condition.



Teflon packing rings on duplex pump handling 50% sodium hydroxide at 270 F. showed no sign of wear after 5 months. Formerly, packing lasted average of 30 days.

GARLOCK TEFLON*

Packings Reduce Process Shutdowns

Garlock LATTICE-BRAID† Packings of Teflon reduce maintenance, lower replacement costs, reduce wear on pistons and shafts, and increase productive capacity in countless pump applications where corrosive chemicals and severe operating conditions are encountered. The unique properties of Teflon (chemically inert, heat-resistant, low coefficient of friction, etc.) make it outstanding for use in chemical or petroleum process pump packings.

LATTICE-BRAID Packings of Teflon are another important part of "the Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals to meet all your needs. It's the only complete line. That's why you get *unbiased* recommendations from your Garlock representative. Call him, or write for LATTICE-BRAID Catalog AD 131.

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada. For information on other fluorocarbon plastic products contact United States Gasket Company, Plastics Division of Garlock.

*DuPont Company Trademark †Registered Trademarks

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints, Fluorocarbon Products

TABLE I—SURVEY PAPERBOARD CAPACITY BY GRADES 1956-1959
313 DAY BASIS—M TONS

Item	Total	LINER		CORRUGATING MATERIAL						BOXBOARD			
		Cylinder Kraft	Fourd. Kraft	Jute	Kraft	Semi-Chemical	Straw	Other	Container Chip & Filler Bd.	Folding	Set-Up	Bleached Boards Incl. Spec. Food Bd.	All Other
CAPACITY IN EXISTENCE OR UNDER CONSTRUCTION													
Capacity End of 1956	15,328	183	3,897	968	115	1,528	249	582	312	3,031	736	1,392	2,335
1957													
New Machines	1,002	—	519	125	—	191	—	16	5	29	23	89	5
Improvements	504	—31	173	36	—5	156	12	—9	6	101	7	22	36
1957 Increase	(1,505)	(—31)	(692)	(161)	(—5)	(347)	(12)	(7)	(11)	(130)	(30)	(111)	(41)
Capacity End of 1957	16,834	152	4,589	1,129	110	1,875	261	589	323	3,161	766	1,503	2,376
1958													
New Machines	217	—	40	—	—	55	—	—	—	—	—	122	—
Improvements	20	—	—	—	—	20	—	—	—	—	—	—	—
1958 Increase	(237)	(—)	(40)	(—)	(—)	(75)	(—)	(—)	(—)	(—)	(—)	(122)	(—)
Capacity End of 1958	17,071	152	4,629	1,129	110	1,950	261	589	323	3,161	766	1,625	2,376
1959													
New Machines	28	—	—	—	—	—	—	—	—	—	—	28	—
Improvements	0	—	—	—	—	—	—	—	—	—	—	—	—
1959 Increase	(28)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(28)	(—)
Capacity End of 1959	17,099	152	4,629	1,129	110	1,950	261	589	323	3,161	766	1,653	2,376
CAPACITY INCREASE UNDER CONSIDERATION BUT NOT STARTED													
1958													
New Machines	463	—	141	—	—	78	—	—	—	75	—	127	42
Improvements	277	—16	46	41	—	41	8	16	2	48	3	81	7
1958 Increase	(740)	(—16)	(187)	(41)	(—)	(119)	(8)	(16)	(2)	(123)	(3)	(208)	(49)
1959													
New Machines	539	—	219	—	—	141	—	18	—	47	—	110	4
Improvements	137	—	94	12	—4	6	—	4	2	17	1	—4	9
1959 Increase	(676)	(—)	(313)	(12)	(—4)	(147)	(—)	(22)	(2)	(64)	(1)	(106)	(13)
Total Increase '58 & '59	1,416	—16	500	53	—4	266	8	38	4	187	4	314	62

Survey of Paperboard Capacity By Grades

Alvin A. Newburg

Statistician, National Paperboard Assn.

We presented capacity surveys for pulp and paper in the June 17th issue of PAPER TRADE JOURNAL. With release of the paperboard figures here, the picture is now complete.

A year ago at this time the Department of Commerce and the BDSA were asked by the House Committee on Interstate and Foreign Commerce to prepare a comprehensive study covering the capacity, supply and demand for paper and paperboard. The Department of Commerce asked members of the industry to meet with them and a capacity survey form and instructions were prepared. This survey was conducted by the American Paper and Pulp Assn. and the National Paperboard Assn.

Capacity is a nebulous, will-of-the-wisp which depends on many things. It is very easy to have a single machine produce tonnage at rates which are 25 per cent different in the same day. I believe that our records show that in addition to variability on size of output, some paperboard machines can produce a variety of grades which have different end uses.

Our 1956 statistical yearbook shows that the 1956 capacity for the 313 day year was 15,283,000 tons. This compares with the production of 14,366,000 tons which represents 94 per cent of the capacity. We know that certain machines are installed and certain labor agreements are written so that some machines can run 7 days per week. The northern machines normally operate on a 6 day basis, but providing the demand for tonnage is there, they might run a number of 7 day weeks before closing down for a clean-up.

Before we actually get into the results of the survey, which we made for the Department of Commerce, it is very important to understand the basis for the study of these figures. The members of the industry were asked to list the daily tonnage which could be produced with full use of the equipment, assuming adequate raw materials and labor. The annual capacity was defined as the full daily capacity multiplied by the number of days in a year that a mill could operate assuming an all-out demand for all products of the paper and paperboard industry. However, even though this was to be the all-out operation of the machine, it was felt that it should still be practical, that the mills might not necessarily produce the one grade, or basis weight of one grade, which was best suited for that machine's operation and therefore the highest potential capacity was not the exact figure looked for. It was felt that in an emergency the companies would have to produce approximately the same type of product produced in the past. However, within the limits prescribed, the industry was to list the annual capacity in total and assign to the various grades the type of output which they had produced.

313 Day Year Figures

Table I presents the 313 day per year capacity figures. The first line shows that the total capacity at the end of 1956 was 15,328,000 tons. These are fairly realistic figures. They are based on a 6 day week and the industry has never operated at a rate higher than 99 per cent of a 313 day year, which is the 6 day week. Note that the 1956 figures grow very rapidly during 1957 and 1958. By the end of 1959 the total tonnage is listed as 17,099,000 tons of capacity. All of this capacity which we have been discussing is either in existence or actually under construction, taken as of the fall of 1956.

On the lower section of Table I we show figures for 1958 and 1959 which are the capacity increases under consideration, but not started, again taken as of the fall of 1956. As you see, the total of these figures is quite large, being 1,416,000 tons. The largest increase is going to be in the fourdrinier kraft liner field.

All-Out Basis

Table II presents the capacity figures on the "All-Out" basis. We also show the number of days capable of being operated for each grade as of the end of the year 1959. "All-Out," as was stated previously, is the basis on which the survey was made. These figures contemplate an emergency basis where there is a heavy demand for all paper and paperboard products and an adequate supply of raw materials.

There are some big figures here. The 1957 capacity increase is 1,622,000

TABLE II—SURVEY PAPERBOARD CAPACITY BY GRADES 1956-1959
"ALL-OUT" BASIS—M TONS

Item	Total	LINER: Cylinder Kraft	LINER: Fourd. Kraft	CORRUGATING MATERIAL: Jute	CORRUGATING MATERIAL: Kraft	CORRUGATING MATERIAL: Semi-Chemical	CORRUGATING MATERIAL: Straw	CORRUGATING MATERIAL: Other	BOXBOARD: Container Chip & Filler Bd.	BOXBOARD: Folding	BOXBOARD: Set-Up	BOXBOARD: Bleached Boards Incl. Spec. Food Bd.	BOXBOARD: All Other
CAPACITY IN EXISTENCE OR UNDER CONSTRUCTION													
Capacity End of 1956	16,536	203	4,384	1,024	131	1,690	271	600	325	3,133	741	1,535	2,499
1957													
New Machines	1,085	—	580	125	—	199	—	16	5	31	23	101	5
Improvements	537	—31	196	37	—7	174	13	—15	6	101	7	19	37
1957 Increase	(1,622)	(—31)	(776)	(162)	(—7)	(373)	(13)	(1)	(11)	(132)	(30)	(120)	(42)
Capacity End of 1957	18,158	172	5,160	1,186	124	2,063	284	601	336	3,265	771	1,655	2,541
1958													
New Machines	225	—	45	—	—	52	—	—	—	—	—	128	—
Improvements	20	—	—	—	—	20	—	—	—	—	—	—	—
1958 Increase	(245)	(—)	(45)	(—)	(—)	(72)	(—)	(—)	(—)	(—)	(—)	(128)	(—)
Capacity End of 1958	18,403	172	5,205	1,186	124	2,135	284	601	336	3,265	771	1,783	2,541
1959													
New Machines	0	—	—	—	—	—	—	—	—	—	—	32	—
Improvements	32	—	—	—	—	—	—	—	—	—	—	—	—
1959 Increase	(32)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)	(32)	(—)
Capacity End of 1959	18,435	172	5,205	1,186	124	2,135	284	601	336	3,265	771	1,815	2,541
Days	338	355	352	329	354	343	338	320	326	323	315	344	335
CAPACITY INCREASE UNDER CONSIDERATION BUT NOT STARTED													
1958													
New Machines	511	—	155	—	—	86	—	—	—	83	—	141	46
Improvements	321	—18	68	46	—	44	9	16	3	52	4	90	7
1958 Increase	(832)	(—18)	(223)	(46)	(—)	(130)	(9)	(16)	(3)	(135)	(4)	(231)	(53)
1959													
New Machines	600	—	245	—	—	156	—	19	—	53	—	122	5
Improvements	148	—	105	12	—5	7	—	4	2	18	—	—4	9
1959 Increase	(748)	(—)	(350)	(12)	(—5)	(163)	(—)	(23)	(2)	(71)	—	(118)	(14)
Total Increase '58 & '59	1,580	—18	573	58	—5	293	9	39	5	206	4	349	67
Days	349	—	358	337	—	344	360	328	333	346	308	348	342

tons and at the end of 1959 the total reaches 18,435,000 tons, excluding the "Under Consideration" items. The companies reported last fall that in both 1958 and 1959 they had plans under consideration to install additional tonnage to the extent of 1,580,000 tons. Since that time there have been announcements that some companies intended to delay the building of their additional capacity. These delays are not reflected here and it may be that some of these plans may never materialize.

When we look at these figures, we should remember that they are "All-Out" and what that term means.

The 338 days shown for the total—and that is a weighted figure—would represent 108 per cent of the time which this association has considered as the 100 per cent since it started back in 1933. When we add the tonnage shown as 349 days to the weighted average, it still continues as 388 days, or 108 per cent.

Earlier we looked at the 15,283,000 tons of annual capacity which is shown in our statistical yearbook for the year 1956. If we multiply that figure by 108 per cent, we arrive at a total of 16,506,000 tons which would be the capacity for the year on an all-out basis. This figure is very close to the 16,536,000 tons which is shown for the capacity on an all-out basis at the end of 1956. Therefore, we feel that the capacity figures which we have been developing for you on a year-to-year basis are fairly practical and substantially correct. We still have to remember that the capacity at the end of the year is, of course, greater than the amount which is the capacity for the year since the new capacity items are not all in use for the full year.

Analyses by Types

We show in Table III on Page 28 the total of all the grades consolidated into two main types of board; namely, containerboard and boxboard. In Table III you will find that we were able to show the regular 6 day per week, or 313 day capacity, as well as the all-out, or 338 day capacity. This has been done as a convenience since the figures are the same as are shown on the other two exhibits. It's quite interesting to note that on the all-out basis, containerboard increases from 8,628,000 to 10,043,000 at the end of 1959. In addition, the mill owners had 954,000 tons of increased containerboard capacity in mind which means that on this basis we could make 11,000,000 tons in one year.

Boxboard, on the other hand, is not exactly "taking a back seat." By 1959 the boxboard industry will have almost 8.4 million tons and in addition had 626,000 tons under consideration; all of this on an all-out basis.

What about Demand

Now that we have taken a look at these figures, the first question that pops into our mind is, "What about our potential demand based on our growth factors?"

We know that the paperboard industry has to have sufficient tonnage on a standby, or unused, capacity basis which will take care of our seasonal activity. I know that we have the fall months of October and November at an average of 7 or 8 per cent higher than the previous months. There have been occasions when the business cycles and the seasonal cycles are both on the upturn. In some of the past years we have the fall months increase 15 to 20 per cent over the average. Therefore, we think that point number one should be that we must have sufficient capacity to take care of the variable requirements of our customers.

There is a big advantage in developing a capacity figure for some of the future years so that we may realize what the conditions are in our industry and can face up to the facts. All of which reminds me of an incident along this line. In 1949 I prepared a chart which took the production in 1925, which was 3,125,000 tons, and added 5 per cent per year as a trend line. When 1949 was finished, our activity was only 83 per cent and the 5 per cent trend showed approximately 10,080,000 tons and was 1 million tons higher than the production. In other words, it looked like we would never catch up and a few members told me about it. I followed these figures for the years since then. Let's look at the record. This trend which was far above the production by 1951 was 800,000 tons lower than the production; in 1953 it was 260,000 below production; in 1955 it was 500,000 tons lower and in 1956, 180,000 less than the output.

Fortunately, the staff does not have to make predictions on the tonnage which the industry is going to expect in any one year. At the same time, it's not which of a forecast to point out that in 1957 we may not have a 5 per cent growth but, in fact, we may have a decrease. However, if the odds were right, I might be tempted to make a small "book" on how the figures were going to turn out in a couple of years from now based on nothing more than the trend story I just told you.

If we add 5 per cent on each year from 1925 through the year 1960, we would have production in that year of 17,250,000 tons. Please understand that this is not a forecast, but is merely an extension of the trend line which has started out at 1925 and I stopped at 1960 because we have capacity as of the end of 1959. Taking the basis of the capacity under construction and adding the proposed or "under consideration" capacity, we would have had a capacity figure of roughly 18,500,000 tons. Now we know that some companies have already announced they will not complete their increases by the year 1959, that they have been delayed; therefore our figures should not be quite this high. By division we would arrive at on operation rate of 93 per cent on the 6 day or practical basis. Two eminent forecasters who work in our industry have indicated that a 5 per cent trend line is not out of line and they have made forecasts along those lines. Other people, more conservative, have said that the production in the year 1960 will not be nearly as large as the figures we have anticipated under these 5 per cent trend line conditions. Therefore, we have to take our choice, but to me it does not appear that this is an insurmountable goal.

Operating Rates

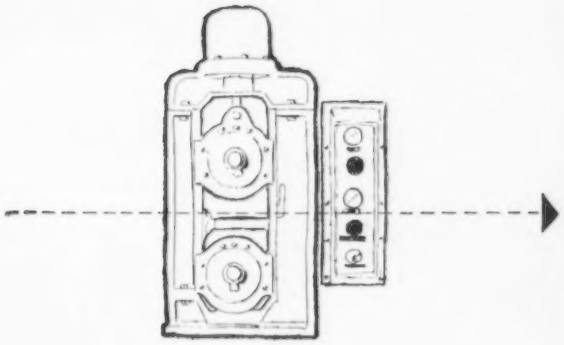
I believe that before we leave this subject of capacity, there is one more important item that we should remember. This is the fact that there are years when we do not have the orders or the basic demand to sell our products at a rate which keeps our machines running 7 days a week. Paperboard is not an item that is stockpiled by a number of individuals. In fact, we can't put on a sale and have the housewife stack it up in the back yard. If we see that we have overexpansion at any given time, it should only mean that the mill is probably going to have less running time later in that particular year. If we look at history we find that in 1951 the industry operated 94 per cent of a 6 day week, but in the year 1952, the industry operated at 85 per cent, which means practically five days a week. Last year we were back to 94 per cent again. Because it takes a couple of years to build a machine and get it in proper operating condition, it stands to reason that some company's machine is going to come into production at a time when the demand is not "All-Out." (In fact it might be coming in now and I've heard the current demand defined as something less than high pressure.) If at a time like this we face the facts, we will understand that with increases in capacity and the same demand, it is axiomatic that we will have less running time for a given period. However, it is a long road that does not have a turning and we have seen history where we were very pleased to have the standby capacity.

Submitted at meeting of National Paperboard Assn., The Greenbrier, White Sulphur Springs, W. Va., May 21-22, 1957.

TABLE III—SURVEY PAPERBOARD CAPACITY BY TYPES 1956-1959

M Tons

Item	313 DAY BASIS Total	313 DAY BASIS Containerboard	313 DAY BASIS Boxboard	ALL-OUT BASIS Total	ALL-OUT BASIS Containerboard	ALL-OUT BASIS Boxboard
CAPACITY IN EXISTENCE OR UNDER CONSTRUCTION						
Capacity End of 1956	15,328	7,834	7,494	16,536	8,628	7,908
1957						
New Machines	1,002	856	146	1,085	925	160
Improvements	504	338	166	537	373	164
1957 Increase	(1,506)	(1,194)	(312)	(1,622)	(1,298)	(324)
Capacity End of 1957	16,834	9,028	7,806	18,158	9,926	8,232
1958						
New Machines	217	95	122	225	97	128
Improvements	20	20	(—)	20	20	(—)
1958 Increase	(237)	(115)	(122)	(245)	(117)	(128)
Capacity End of 1958	17,071	9,143	7,928	18,403	10,043	8,360
1959						
New Machines	28	—	28	32	—	32
Improvements	0	—	28	0	—	—
1959 Increase	(28)	(—)	(28)	(32)	(—)	(32)
Capacity End of 1959	17,099	9,143	7,956	18,435	10,043	8,392
Days	313	313	313	338	344	330
CAPACITY INCREASE UNDER CONSIDERATION BUT NOT STARTED						
1958						
New Machines	463	219	244	511	241	270
Improvements	277	138	139	321	168	153
1958 Increase	(740)	(357)	(383)	(832)	(409)	(423)
1959						
New Machines	539	378	161	600	420	180
Improvements	137	114	23	148	125	23
1959 Increase	(676)	(492)	(184)	(748)	(545)	(203)
Total Increase 1958 & 1959	1,416	849	567	1,580	954	626
Days	313	313	313	349	351	346



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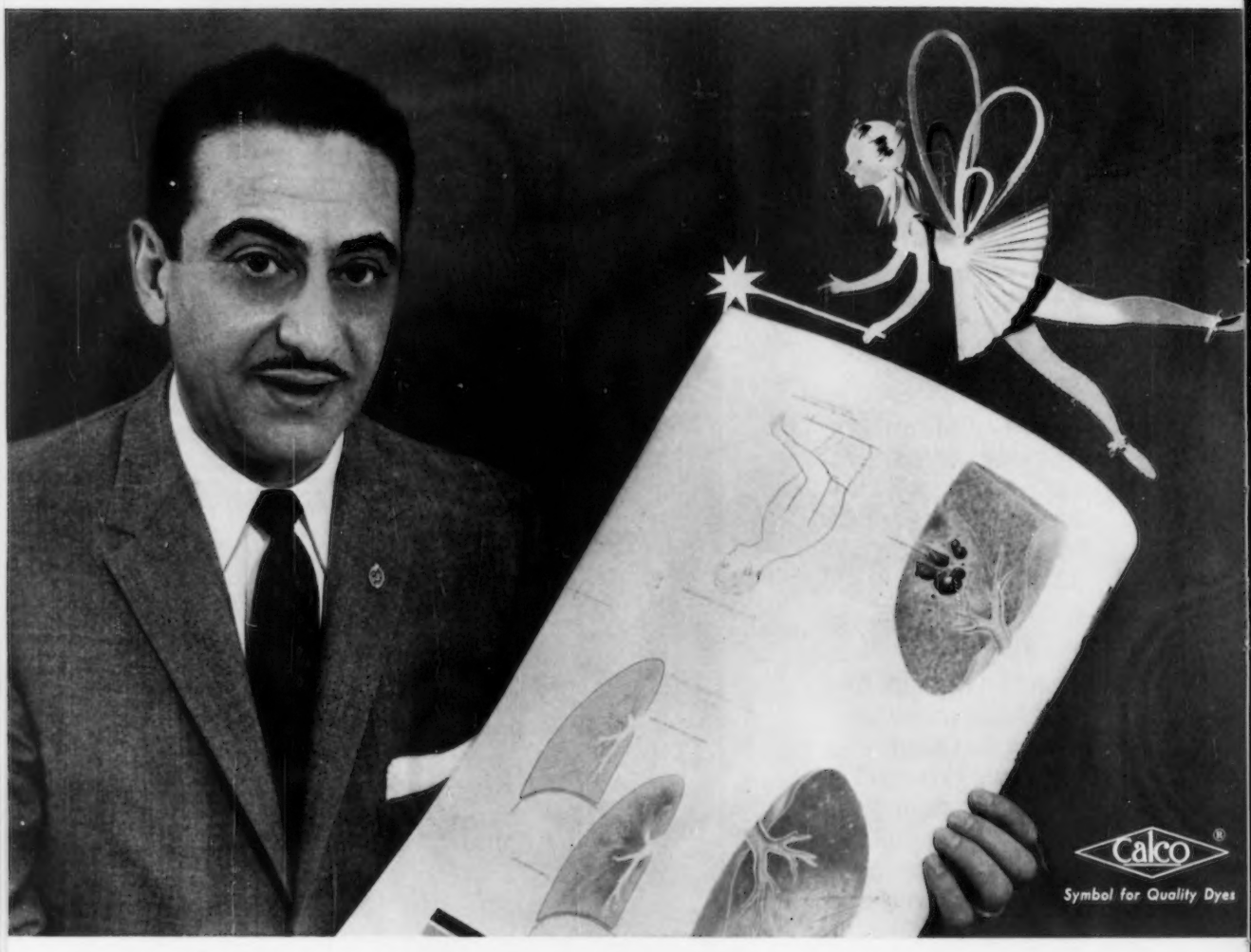

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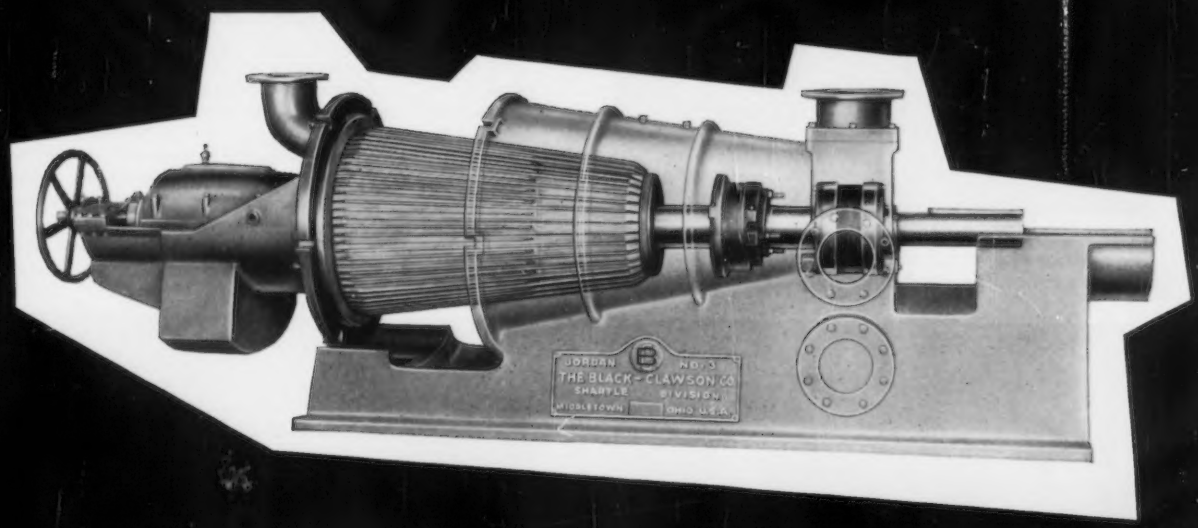

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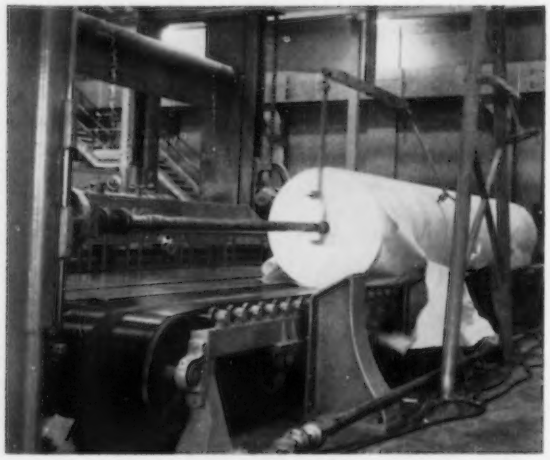
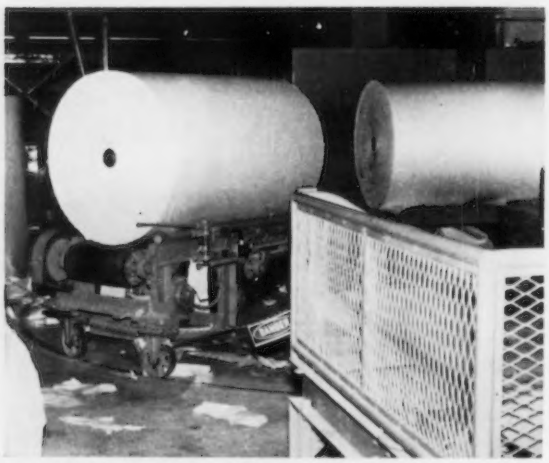
New Look in Roll



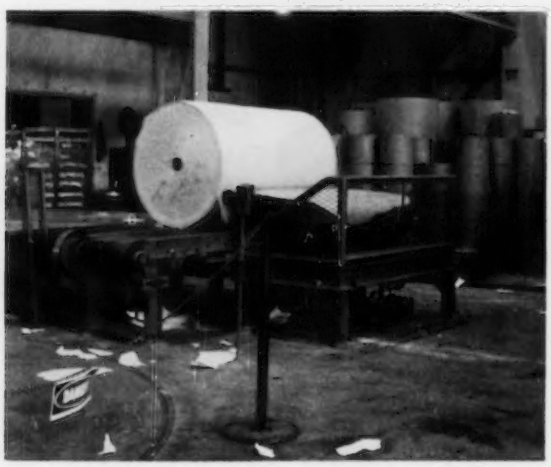
1—SET OF ROLLS FROM WINDER is lowered onto a conveyor so that end of shaft is held by anchor post, left. Rolls are then stripped off shaft by the conveyor.

The new roll handling system installed at Ontario and Minnesota Paper Co.'s Kenora newsprint features a complicated conveying system and the elimination of "Man Handling."

Starting at the winder, **1,** a set of rolls is lowered onto a conveyor so that the end of the winder shaft is held by an anchor post. The rolls are then pulled off the shaft by the conveyor. They then move by gravity to the sorting deck, **2.** The rolls are inspected here and okayed rolls are allowed to roll forward by controlled stops. They are then pushed mechanically to another conveyor, **3,** at the end of which the rolls change direction and are swung around, **4,** by a short swing conveyor to the wrapping machine deck. **5.** Stops control flow of rolls into the wrapping machine. The

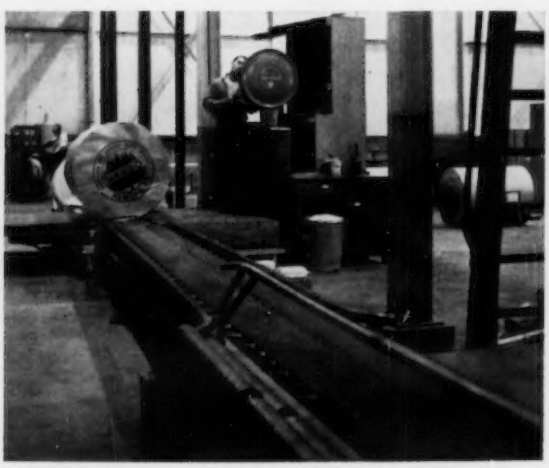


3—FROM SORTING DOCK, rolls are pushed across a bridge to another conveyor at end of which rolls change direction by means of short swing conveyor.



4—AFTER BEING SWUNG AROUND to end of wrapping machine deck, automatic pusher shoves them off conveyor to platform in front of wrapping machine.

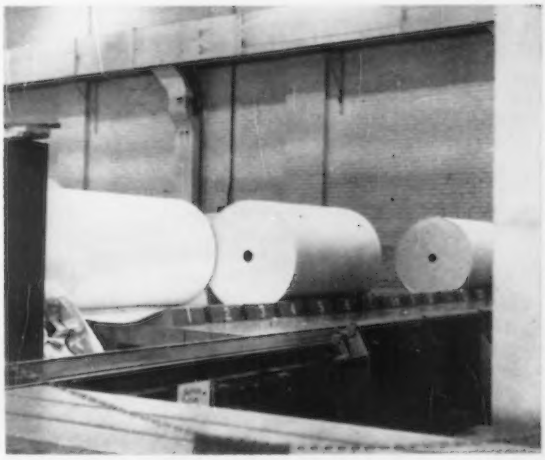
7—GLUED HEADS are placed on platen of roll header, and held in place by suction. Heated platens press heads onto roll and hold them while glue cures.



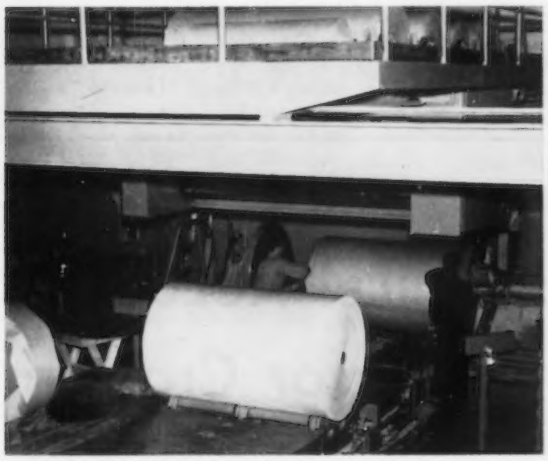
8—HERE ROLL HAS REACHED SCALE, which is actually a portion of the conveyor supported on weighting mechanism. Pertinent data is recorded by scaler.

Handling at O&M

width of wrapper required for each roll is selected by push-button, and is cut off automatically. The ends of the wrapper are hand crimped. The roll heads receive an application of glue, **6,** and are compressed on the ends of the rolls in the heading machine, **7.** The completely wrapped roll is ejected from the heading machine onto a conveyor which takes it past the scales, **8.** The scales are located right in the conveyor line. From here the rolls are ejected onto a conveyor which takes them to the train shed, **9.** The conveyor is constructed so that the end can be tipped up at an angle of 90°, so as to stand the roll on end, **10.** From here the up-ended roll slides down a ramp to be picked up by an electric truck and loaded into a box car or sent to storage.

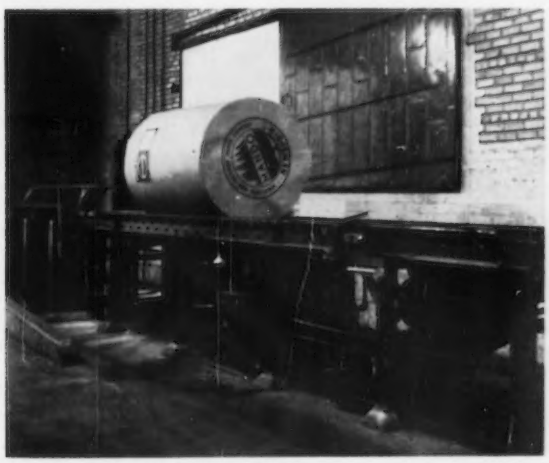


2—AS THEY ARE REMOVED FROM SHAFT, the rolls move to the sorting dock. At this point inspection, sampling and numbering of rolls takes place.



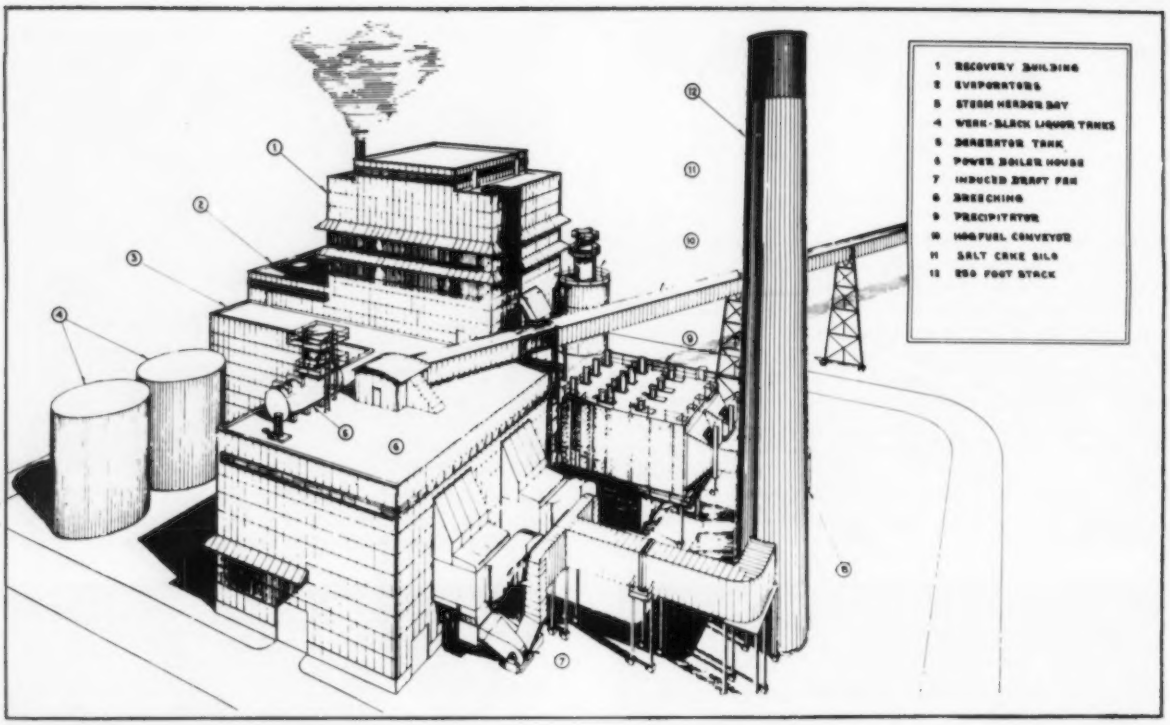
5—OVERALL VIEW of wrapping machine. At top can be seen various size rolls of wrapping paper. Wrapper feeds from here down to wrapping deck.

6—CIRCULAR ROLL HEADS are given coat of glue in proper places with sprayer. These heads are to protect ends of roll in handling and shipment.



9—TRAINSHED CONVEYOR moves roll to unloading position. End of this conveyor is constructed in such a way that it can stand the roll on end.

10—END OF CONVEYOR has raised to upend the roll. It slides down roller ramp into position to be picked up by electric truck and loaded in boxcar.



How the Heat and Chemical Recovery Systems Were Engineered for Crofton

Erection of the new British Columbia Forest Products bleached kraft pulp mill at Crofton, B. C. continues on schedule. As a follow up to previous articles on this mill here is a description of the power generation and chemical recovery systems.

The Recovery Boiler, steam boilers, multiple effect black liquor evaporators and all auxiliaries for these units are grouped together in one building area under the supervision of the chief steam engineer. This arrangement has been found to give the best control of the operation and maintenance of the equipment with a minimum crew.

The main buildings are structural steel with asbestos cement board wall panels, concrete or steel grating floors, and precast concrete roof slabs; designed to be easily cleaned and reduce maintenance costs. Totally enclosed electric motors, waterproof lighting fixtures, air conditioned load centers and ventilated water tight instrument panels are installed for the same reason.

Evaporators

The sextuple effect evaporators are furnished by the Conkey Division of Chicago Bridge & Iron, built in Canada by Horton Steel Works, and are designed to evaporate 500,000 lbs. per hour of weak black liquor from 15 per cent total solids entering the 52 per cent total solids leaving, using steam at 40 p.s.i.g. To minimize iron pickup by liquor, and to increase life of the unit, the first and second effect vapor heads are stainless clad and first effect tubes and tube sheets are of stainless type 304. An indirect surface condenser is installed on the sixth effect to generate hot water for the pulp mill washer showers. All contaminated condensate is also utilized to conserve heat. Liquor pumps are of stainless construction and strong liquor lines subject to severe corrosion are also of stainless. The Foxboro evaporator controls are grouped in an instrument panel adjacent to the recovery boiler panel. The controls supplied measure steam flow, liquor flow, steam, liquor and vapour temperatures. Automatic control is normally by steam pressure, with weak black liquor automatically controlled to a standard flow volume.

Recovery Boiler

The recovery boiler is supplied by Combustion Engineering, and is designed to burn 1,600,000 lbs. of dry black liquor solids per 24 hours, generating steam at 625 p.s.i. and 750 degree F. The furnace is relatively new, employing a straight through gas flow instead of the usual three passes, and using a platen type superheater and slag screen. Steam soot blowers are expected tc keep the tubes clean with only occasional hand lancing. Chemical ash dislodged from the tubes is dissolved

in strong black liquor and returned to the cascade evaporators. The two cascade evaporators are arranged for series flow of liquor and parallel flow of gas, the cascades being set vertically on different elevations. The black liquor is concentrated to 64-72 per cent dry solids, mixed with salt cake and pumped by deLaval pumps to spray nozzles located on four sides of the furnace. Preheated air is injected at the primary air ports, and at the secondary tangential air ports above the liquor nozzles. Tangential air has proven to be efficient on previous installations. Smelt collects on the water cooled decanting type furnace bottom, and is tapped off a conventional dissolving tank, but a chemical recovery spray unit is installed to recover entrained soda from the vent stack.

Instruments are provided to give almost complete automatic control of furnace operation. The density of the strong black liquor from the cascades is measured by the electrical load variations, and dilution is automatically added as required. Liquor flow to the nozzles is measured by a Foxboro magnetic flow meter. The total air flow, primary and tangential air flow are individually recorded and controlled. Furnace flue gas is analyzed for combustibles and 0_2, thus the combination of fuel flow, air flow and flue gas quality permits of almost automatic operation. Boiler instrumentation is generally by Bailey and all recorders and controls are centralized on the boiler panel board.

Precipitator

Flue gases from the recovery boiler are treated in a Koppers two-chamber three-cell electrostatic precipitator, of tile and concrete construction with a flat steel bottom. The unit has a capacity of 192,000 c.f.m. at an efficiency of 95 per cent, with two cells in operation, and 98 per cent with three cells. Rectifiers are electronic with automatic voltage control. Extra care was taken in the sizing of the precipitator to eliminate any dust nuisance. Collected ash is recovered from the flat bottom by a drag conveyor and dissolved in 52 per cent solids black liquor, the liquor then is pumped to the furnace cascade evaporators. Flue gases are drawn through the precipitator by a turbine driven induced draft fan, which discharges the cleaned gas to a 250 ft. concrete brick stack, built by Custodis Co.

Power Boilers

Steam requirements over the capacity of the recovery boiler are met with two Foster-Wheeler semi-outdoor two-drum baffleless steam generating units. Each is designed to produce 200,000 pounds per hour at 625 p.s.i.g. and 750 degree F. when burning oil. However, each unit is supplied with a grate bottom and pneumatic fuel distributors to burn hogged wood and bark fuel straight, or in combination with oil. This hog fuel originates in part from the hydraulic barker plant, and in part from outside sawmill waste. A cinder recovery system, with reinjection to the furnace, is supplied on each boiler, to eliminate the emission of fly ash from the stack. Steam operated fixed and retractible soot blowers are supplied, which practically eliminate the need of hand lancing. The boiler control instruments, supplied by the Bailey Meter Co., are grouped in a panel and include fuel oil flow, steam and air flow and flue gas combustibles and oxygen analysis. Consequently, the boilers will operate almost automatically.

The units are housed in the same structure as the recovery boiler, so that the shift engineer can readily supervise their operations. The induced draft fans, located outside the building, discharge the cleaned flue gases to the 250 ft. concrete stack.

Auxiliaries

In the same structure with the power boilers are located the various auxiliaries which include the mill air compressors, the turbine driven high pressure water pump for the hydraulic barker, the feedwater treatment equipment, boiler feed pumps, the engineer's office and testing laboratory. The boiler feedwater consists of returned condensate and about 20 per cent raw water makeup. The raw water is treated in a Permutit demineralizing plant consisting of two anion and two cation units, which produce a water of 3 p.p.m. total solids maximum including a maximum of 0.1 p.p.m. silica. This equipment safeguards the boiler against tube scaling and other types of tube trouble attributable to feedwater. The treated water then flows to a hot well, where it is combined with returned condensate and is then pumped to a Permutit deaerating heater of 500,000 pounds per hour of water capacity. The deaerated water is then pumped to any of the three boilers by individual Bingham turbine driven pumps of stainless construction. The whole feedwater cycle is under automatic instrument control.

Recausticizing

The recausticizing system is a conventional Dorr system with a hot lime slaker-classifier, three causticizing tanks 10 ft. diameter by 10 ft. high; a green liquor single compartment clarifier 40 ft. diameter by 15 ft. high; a four tray parallel flow white liquor clarifier 35 ft. diameter by 25 ft. high; a four tray two stage mud washer 35 ft. diameter by 25 ft. high; a mud storage tank 20 ft. diameter by 18 ft. high; a single compartment dregs washer 20 ft. diameter by 18 ft. high. Mixing tanks, Dorr mud pumps, liquor pumps and the necessary liquor storage tanks complete the plant. The hot end of the lime kiln, the lime slaker, causticizers and the operations control structure are housed in reinforced concrete structure with a precast concrete slab roof, to reduce building maintenance to the minimum. Where necessary pumps and mechanical equipment are of stainless to prevent iron pickup by the liquor, and to reduce maintenance. The process is under Foxboro instrument control to a high degree; the slaking operation controlled by green liquor flow, hot reburned lime flow proportioned to the liquor, and temperature controlled. All instruments and controls are centralized in a panel located in the operator's control station and laboratory.

Lime Reburning

Mud from the storage tank is dewatered to 70 per cent solids on a Dorr-Oliver 6 ft. diameter by 10 ft. mud filter of stainless and meehanite cast iron construction. The mud is then fed by screw conveyor to a Traylor lime kiln 10 ft. diameter by 250 ft. long. The flow of mud and operation of the filter is under automatic control from the kiln operator's station at the hot end of the kiln. Flue gases from the kiln are cleaned in a spray chamber and a stainless Peabody scrubber, which produces a stack gas free of entrained lime and soda fume. Mud passes through the drying zone of the kiln to the hot zone and is calcined and discharged. Instrumentation is provided to control the temperature of the hot zone. This is achieved by measuring the hot zone temperature by means of a radiation pyrometer which in turn controls the oil flow to the kiln. The flow of oil is recorded. The primary air is set manually but the secondary air is set automatically by means of an excess oxygen analyzer testing the exhaust gas from the kiln. Temperatures through the kiln are also determined by themocouples. The draft control by temperature setting is also automatic. All instruments and controls are centralized. Hot lime produced is stored in a hot lime silo fed by a totally enclosed dust tight bucket elevator. The kiln operator controls the lime slaker which provides slaked lime for the bleach plant; the other slaker being tied into the Dorr system. The entire causticizing operation produces white liquor at the rate of 15,500 lbs. of active soda as Na_2O, per hour, with a minimum of operating and maintenance labor, and the equipment provides results in excellent working conditions with very little annoying dust, heat and fume.

How Much Do You Know About Wet Strength Papers*

*From a lecture presented to the students specializing in pulp and paper technology at the University of Maine.

K. W. Britt

Associate Director of Chemical Research,
Scott Paper Co., Chester, Pa.

Paper is characterized by great variety. It may be thick or thin, strong or weak, rough or smooth, white or colored, absorbent or water repellent. In fact if one were to ask what property do all papers have in common, there might be some difficulty in finding an answer. I will suggest that until fairly recently we could answer that question in this way: when thoroughly saturated with water all papers lose nearly all (90% or more) of the strength that they possess when dry. However, due to the advances in technology we now have paper that retains a very substantial portion of its strength even when completely wet. We will attempt to review some of the factors concerning this wet strength paper.

The loss of strength of paper when wet is in contrast to the behavior of textiles under the same conditions. Most textile products are as strong wet as they are dry, and among those that do lose strength when wet, the loss is much less percentage wise than it is with paper. For this and other reasons it is obvious that the nature of the bonding or coherence between fibers is fundamentally different in paper from what it is in textiles. Not only is the interfiber bonding of paper unique, but it is also to a considerable degree mysterious. Hence, it has been the subject of much speculation, considerable observation, and to a lesser extent, deliberate experimentation. In the early days there was a tendency to look to mechanical entanglement of fibers and fibrils of paper as the source of strength. Of late, the view is widely, though not universally, held that the true explanation lies in the field of inter-molecular forces of the nature of van der Waals forces and hydrogen bonding.

It is not the purpose of this paper to review the subject of interfiber bonding. There is, however one point that is pertinent to our subject and therefore deserves some emphasis. This is the behavior of paper when wetted by liquids other than water. Some years ago Kress and Bialkowsky of the Institute of Paper Chemistry published a paper describing the use of liquids other than water as forming media for paper and showed that only a few liquids would allow the formation of interfiber bonding. They found that only those liquids that are swelling agents for cellulosic fibers would serve suitably as forming media for paper. It has also been found that liquids are not equal in their ability to weaken paper. The wet tensile test is a quantitative measurement of this weakening and permits a fairly exact comparison among various liquids.

TABLE I

	Tensile Strength lbs./inch width
Dry Paper	9.83
Wetted with water	0.98
Wetted with methyl alcohol	3.40
Wetted with ethyl alcohol	4.74
Wetted with n-propy alcohol	5.96
Wetted with n-butyl alcohol	6.24
Wetted with n-amyl alcohol	6.94
Wetted with n-hexyl alcohol	7.21
Wetted with n-heptyl alcohol	7.65
Wetted with n-actyl alcohol	7.84

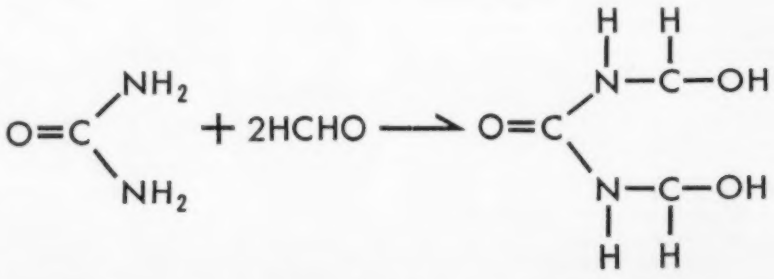
Table I gives tensile strength values of the same paper when wetted with various aliphatic alcohols.

It is interesting to observe that each alcohol has a characteristic degree of weakening which is distinctly different from that of even its closest neighbors in the series, and which decreases as the molecular weight of the alcohol increases. It is evidently the hydroxyl group of the alcohols that is responsible for the weakening effect. It has been observed that pure hydrocarbons do not weaken paper when used as wetting media.

In talking of the wet strength of paper, it is obvious that water must be the wetting liquid in order to have information of quantitative significance. It may seem rather elementary, but many people do not understand that there is a world of difference strengthwise between wetting paper with solvents and with water.

Definition of W-S Papers

With this background we are in a



Urea + Formaldehyde = Dimethylolurea

Figure 1.

position to define what we mean by the term "wet strength paper." The Paper Dictionary (2nd Edition, American Paper and Pulp Assn., 1951) states: "Wet strength paper—A paper which has extraordinary resistance to rupture or disintegration when saturated with water. This property is produced by chemical treatment of the paper or of the fibers from which it is made." In TAPPI Standard T456-M49 for the testing of wet tensile strength, saturation with water is defined as exposure of the paper to water until the specimen is wetted throughout a stable minimum strength value is obtained.

It is important to distinguish between wet strength and resistance to wetting. Many papers are sized, coated or impregnated with materials that greatly retard the penetration of water into the sheet. For limited times of exposure to water this property may serve the same purpose as wet strength. However, it is usually found that long exposure will eventually result in as much weakening as with absorbent paper. An example of this is waxed paper. One might think that completely waxed paper would exhibit "wet strength" and it does for short periods of time. However, upon exposure to water for periods of 24 to 48 hours produces a high degree of weakening.

Where W-S Papers Are Useful

In the days when paper was used almost exclusively for writing and printing its strength in the wet state was of little concern. As the production of paper increased and the uses of paper products became more diversified, the possibility or probability of the product being exposed to water increased. The desirability of strength in the wet state thus became recognized.

We may outline in general terms the conditions under which paper products may be exposed to water as follows:

1—Exposure to weather. Examples of such products are: military maps, packing cases, outdoor posters, building papers, paper shipping sacks.

2—Exposure to water of paper products used as drying or wiping media. Examples: paper towels, paper napkins, facial tissue, windshield wiping tissue, industrial wiping tissue.

3—Exposure to water of paper used as wrapping for moist materials. Examples: paper bags, wrapping for meat, vegetables, frozen foods, and prepared foods.

4—Exposure to water as part of a processing operation. Examples: photographic paper, blueprint paper, filter paper, saturating paper, tea bag paper, twisting paper.

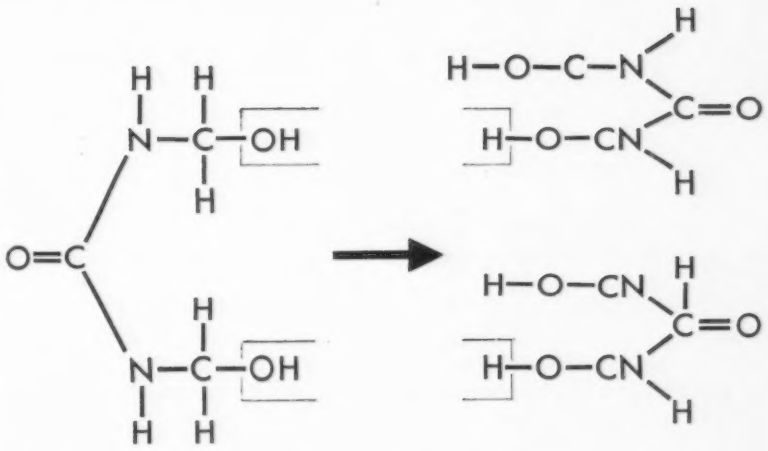


Figure 2— Polymerization of Dimethylolurea

History of W-S Papers

The first product that might be classed as "wet strength paper" was vegetable parchment. This product is made by exposing a sheet of paper to the action of sulphuric acid about 75 percent concentration, followed by removal of the acid by washing. The process results in a high degree of swelling of the fibers which are welded together into a continuous fiber. Thus the paper is profoundly changed from its original state and it acquires new properties such as greaseproofness. Because of these additional properties vegetable parchment is still an important product despite the recent discoveries in wet strengthening methods.

A number of wet strength methods were developed some of which came into small scale commercial use. These methods depended upon bonding the fibers together with some water insoluble adhesive agent. None of these attained large scale use because of operating difficulty, undesirable effects upon the paper properties and because of insufficient degree of wet strength. Some of these will be mentioned later.

The discovery which opened the door to the present large scale development of wet strength paper was the observation that certain thermo-setting synthetic resins when incorporated with paper in the low polymer, water soluble condition may be polymerized *in situ* to give a high degree of wet *strength*. In accomplishing this it is possible to avoid changes in the other properties of paper of an undesirable nature. Also the process has become suitable for mass production on high speed paper machines with relatively little interference with the paper making process.

The cost of the resin treatment is relatively small in proportion to the total cost of the paper product. The amount of resin used is usually less than two percent of the paper by weight.

Finally, the degree of improvement in wet strength is substantial. The treated paper may range from three to ten times the wet strength of the same paper untreated. Accordingly, the user can immediately recognize the improvement and it can be readily demonstrated to buyers and prospective users.

Urea-Formaldehyde

In studying the chemistry of wet strength it is convenient to start with the simplest reaction product of urea and formaldehyde, dimethylolurea. Under alkaline conditions one molecule of urea reacts with two molecules of formaldehyde as shown in Figure 1.

Dimethylolurea is a white crystalline substance soluble to the extent of about 25% concentration in water at room temperature. It is fairly stable under neutral or mildly alkaline conditions, but polymerizes rapidly by condensation in the presence of an acidic catalyst and heat as shown in Figure 2.

Thus it is possible to carry out a very rapid change from a very soluble, low molecular weight, hydrophilic substance to an extremely insoluble, water resistant material. Apparently these are the conditions that favor wet strength formation. The initial form is able to penetrate and become intimately associated with the fiber surface and, upon conversion to the water insoluble form it forms a bridge or bond between the fibers which is unaffected by the presence of water. This process was first put into commercial use about 1938.

DMU is an effective means of producing wet strength by impregnation of the paper sheet. However, when added

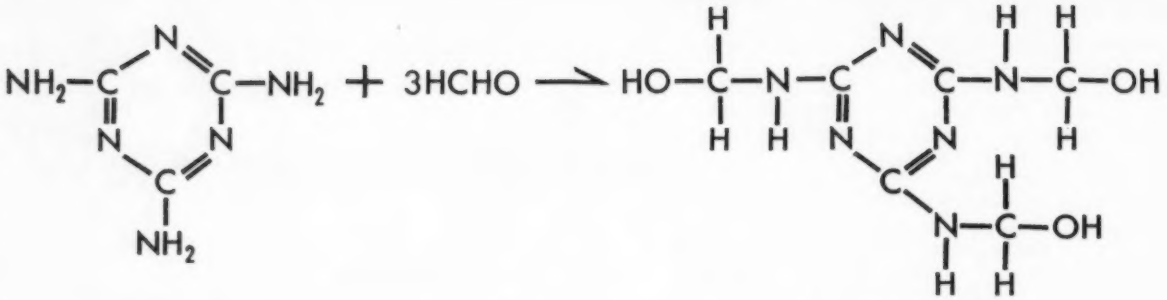


Figure 3.

to paper stock it has no substantivity for fiber and merely follows the tray water.

Melamine Resins

Now let us turn our attention to another class of amino resins, those based upon melamine. Melamine reacts with formaldehyde as shown in Figure 3.

Trimethylol melamine is not sufficiently soluble to be used as an impregnating solution in the manner that DMU is. However, it has another property that DMU does not possess. It is a sufficiently strong base to form a hydrochloride salt that is soluble. The salt readily ionizes into a relatively large cation that includes the melamine formaldehyde portion plus one hydrogen atom, while the chloride forms the anion. At the low pH (about 2) at which this product exists, condensation takes place and a number of the cations co-react to form a still larger positively charged particle. This condensation reaction which proceeds rapidly at first gradually slows down and the system becomes relatively stable with particles of colloidal size, about 100-200 A in size.

This melamine colloid is substantive to cellulosic fiber being rapidly and fairly completely adsorbed. When paper is formed from such melamine treated fiber and the resin cured either rapidly by heat or slowly by aging, the paper develops the property of wet strength. Thus it became possible to produce wet strength paper by the simple process of adding a chemical solution to the papermaking stock. Note the two conditions where necessary, particle size in the colloidal range and a positive electrical charge on these particles. Melamine colloid was first put into commercial use in 1942.

Now turning to the urea-formaldehyde type of resin, it is readily observed that causing polymerization of DMU to occur very quickly results in a hydrophobic molecule that cannot be dispersed in water. Hence, it is obvious that a modifier must be used that will permit molecular growth while preserving a hydrophilic condition. Such a modifier is sodium bisulphite which forms a urea-formaldehyde resin salt and in which the large organic part of the molecule is the anion. This resin is not substantive to fiber but may be precipitated upon fiber by alum in the same manner as rosin size. When fiber is treated in this way, wet strength results and we now have two methods by which wet strength may be produced by stock treatment. These resins were first commercially used in 1943.

Further research on the urea-formaldehyde type disclosed that the use of strong organic bases containing nitrogen gave resins that were positively charged and hence were more substantive to cellulose and more efficient than previous resins. A number to such cationic urea resins have been offered by various chemical companies. This development became commercial in 1946.

The various types of resin have been competing with each other for the past fifteen years with none achieving a completely dominant position. Apparently some conditions favor one while other conditions favor the other. The melamine resins are considerably higher priced than the ureas and are generally more efficient.

Catalysts

We should now say a few words about the so-called "catalysts" used with the resins. These are invariably acidic in nature and may be actual acids or acidic salts. They perform two functions, to aid in the deposition of the resin upon the fiber in the stock treatment method, and to accelerate the cure of the resin after the sheet is formed. Alum is a favorite agent for adjusting the pH in the stock system because it aids in the retention of most resins. However, alum is detrimental to absorbency and where that property is important straight mineral acids are favored. The pH of the system may vary from about 4 to as high as 5.5. Because of the corrosion factor the attempt is made to run as high a pH value as possible. The evidence indicates that the efficiency of the process reaches a maximum at pH 4 and running at higher values costs some loss in effectiveness. With highly substantive resins this loss may be tolerable and many machines are running at pH 5 or slightly higher.

The evidence indicates that the acceleration of cure in the finished sheet is again strictly a function of pH with the most desirable range between 4 and 5. Above 5 the rate of cure is slow and below 4 there is a tendency to hydrolyze the resin and actually decrease wet strength. One of the features of synthetic resin wet strength is that it takes place at room temperature in a time period of several weeks. The length of time to reach a maximum value varies considerably depending upon pH, type of resin and other factors. Maximum may be reached in a few days or the wet strength may continue to increase slowly for several months. Storage temperature has quite an important effect, for example, at temperatures as low as 40° F. the rate of cure approaches zero.

It is fortunate that these resins do cure at room temperature since very few paper machines expose the paper to sufficient heat to effect quick cure. This requires on the average a sheet temperature of about 250° F. for about a minute. It is difficult to define "complete cure" since exposure of the sheet to higher and higher temperature increases the amount of wet strength obtained. For example, heating the sheet to 350° F. for 60 seconds produces a high degree of wet strength that can be obtained at 250° F. regardless of length of time.

Broke Recovery and Hydrolysis

Another fortunate factor in synthetic resin wet strength is the relative ease of broke recovery. It happens that the resin bonding or linkage between fibers is hydrolyzed by exposure to mild acid solutions at elevated temperatures. For example, a broke beater operating at about 180° F. and at a pH of 3.5 to 4

TABLE II—HYDROLYSIS OF WET STRENGTH PAPER 130°F.-30 MINUTES

pH of Buffer Solution	% of Original Wet Tensile Retained	
	UF I	melamine
11.5	60	68
9.0	106	95
5.5	81	100
3.3	23	80
2.0	13	37

will defiber resin wet strength paper readily. Melamine paper is more resistant than urea paper to hydrolysis. This is a slight disadvantage in broke recovery and a slight advantage in permanence of the wet strength in use. In the accompanying Table (Table II) data are presented showing the loss of wet strength of paper exposed to hot buffer solutions of various pH values.

The hydrolysis data has several uses. It serves to show the conditions necessary to recover broke and waste paper, it is a measure of permanence, and it serves to identify an unknown sample of wet strength paper.

Testing Methods and Records

The most important method used in testing wet strength paper is the tensile test described in TAPPI Method T-456-49. Other tests that have been used to some extent are wet bursting strength, wet tearing strength and wet rubbing resistance. Official standards have not been set up for these tests.

In Tables III and IV are given wet tensile data for laboratory made hand sheets treated with graduated amounts of two different urea - formaldehyde resins. Because of the low percentage of fines occurring in laboratory handsheets, the percent wet strength both of the untreated and treated paper is lower than that normally encountered in mill made paper. It is also probable that the increase in dry strength is generally greater than that found in mill made paper. Table V gives tests results of kraft paper treated by impregnation with resin solution.

Control testing of wet strength paper is especially tricky because maximum cure of the resin is not attained on the paper machine reel. It is customary to cure the samples artificially (say 5 minutes at 100° C.) and to judge the effectiveness of the treatment on the basis of the accelerated test. It is important to save samples systematically and keep a running record correlating the natural aging with the accelerated test. There are so many variables that can effect the cure of wet strength resins that there is no fixed formula to relate the accelerated test to the natural aging test. Each machine, each mill, each furnish may have characteristic aging characteristics.

The efficiency of the wet strength process is of vital importance in the successful manufacture of this type of product. The difference in cost of resin alone between good and poor efficiency may be as high as five dollars per ton. Furthermore, the use of excessive resin may cause down time for cleaning felts and other machine parts of equal magnitude. The key to this situation is a system of accurate records.

First, we must know the amount of resin solids used per unit of paper. It is customary to add the resin to the paper stock continuously rather than batch wise. This has been found advantageous for two reasons, first because efficiency is lowered if refining follows the addition of resin and second because quick adjustments in quantity are often necessary. This continuous addition is controlled either by a flow meter or by a metering pump. Thus the approximate proportion of resin to paper is known at all times. For greater accuracy it is also necessary to calculate the total resin used for each day or shift compared with the amount of paper produced.

In addition to the wet tensile test it is important to keep a running record of the comparison between the wet and dry tensile. It is obviously easier to get a high wet tensile test with a strong sheet than with a weak one. A better measure of accomplishment is the ratio of wet strength to dry strength.

Other Wet Strength Processes

It is natural that the synthetic resin processes should receive the major attention in any discussion of wet strength. However, something should be said of other processes that have been proposed.

Acidified formaldehyde — When paper is exposed to formaldehyde in the presence of acid e.g. at a pH value below 3.5, and subsequently heated, a considerable degree of wet strength results. At the same time the fiber is "tendered" or degraded with marked loss in tearing strength. Evidently a chemical reaction between the formaldehyde and the fiber is involved and this has been discussed in the literature. One of the interesting points concerning the acid formaldehyde process is that paper so treated cannot be hydrolyzed, that is, the wet strength cannot

TABLE III

West Coast Sulphite—Freeness 477			Wet Tensile, ounces/inch UF No. 1 Cured		
% Resin	pH	Basis Weight	Wet	Dry	% wet/dry
0	4.0	19	4.2	119.6	3.5
0.516	"	"	19.0	122	15.6
0.995	"	"	28.9	125.6	23.0
1.49	"	"	41.3	141.8	29.1
1.98	"	"	43.7	129.2	33.8
3.04	"	"	52.6	132.4	39.7
4.01	"	"	56.2	149	37.7
4.99	"	"	64.2	130.8	49.5

TABLE IV

West Coast Sulphite—Freeness 366			UF No. 2 Cured		
% Resin	pH	Basis Weight	Wet	Dry	% wet/dry
0.0	4.0	19	6.1	122.8	5.0
0.506	"	"	22.2	123.6	18.0
1.02	"	"	36.5	149	24.5
1.49	"	"	38.1	137.6	27.7
2.06	"	"	45.1	148.4	30.4
3.03	"	"	53.9	143.6	37.6
4.17	"	"	57.5	157.6	36.5
5.20	"	"	55.5	158	35.1

TABLE V

White Kraft Multiwall Bag—50 lb. ream weight 500 ream. Treated with UF resin by sheet impregnation.

% resin in paper	Md wet tensile	Md dry tensile	%
0	16.3	25.2	6.5
1.0	132.8	324	41.0
1.93	154.6	370	41.7
2.96	178.6	374	47.8
3.91	199.6	370	54.0
5.02	211.8	362	58.5

be removed by exposure to hot dilute buffer solutions at any point on the pH scale.

When paper is exposed to high temperature, say about 400° F., a degree of wet strength results and this process has been referred to in several patents. In the absence of any artificial bonding agent this effect is relatively small, but the effect is greatly increased if a protein bonding agent is present. It also greatly increases the effect obtained with the synthetic resins.

Latex

It has been demonstrated that rubber latex, either natural synthetic, when incorporated in paper stock has the ability to confer some degree of wet strength on the paper made therefrom. Neoprene latex in particular has received considerable attention. Latex seriously reduces the absorbency of paper.

Mannogalactan

When a mannogalactan, such as locust bean gum, is incorporated in paper and insolubilized with alkali some wet strength results. The amount of wet strength obtained is relatively small and is of a temporary nature, that, it gradually disappears upon soaking in water.

Silicate

Soluble silicates and colloidal silica have been mentioned as wet strengthening agents for paper. Evidently the process results in the formation of water insoluble silica bonds between the fibers. In some respects the process is analogous to the synthetic resin process in that silica is added to the paper in a soluble or hydrophilic form and is converted to the insoluble form *in situ*. It appears that in this instance a process of dehydration causes the change to the insoluble state.

Markets and Uses

Production of appreciable quantities of wet strength paper commenced about 1940. From then until 1952 a rapid growth occurred, the tonnage of wet strength in that year being estimated at 1,170,000 tons or about five percent of all paper produced in that year. Since then the rate of growth has leveled off somewhat, but production has held consistently at high levels.

The following table gives estimated quantities of wet strength resin consumed by the paper industry in some recent years.

1950	12,436,000 pounds
1953	25,340,000 pounds
1956	30,465,000 pounds

*From a lecture presented to the students specializing in pulp and paper technology at the University of Maine.

NEW LITERATURE

THE PORTLAND COPPER STORY. (Brochure) Reviews the history, operations, services and technical advances in fabrication techniques of **Portland Copper & Tank Works,** 80 Second St., South Portland, Me.

STAINLESS STEEL METER. (Bulletin 94/10) Includes detailed cutaway illustrations, meter and register specifications, and a list of liquids which can be measured with the new Neptune meter. **Neptune Meter Co.,** 19 W. 50 St., New York, N.Y.

PRESSURE REGULATORS. (Brochure 1011) Lists and describes the pilot operated pressure regulators made by **Spence Engineering Co.,** Walden, N.Y.

HASTELLOY CORROSION RESISTANT ALLOYS. (Booklet) This 104 page text relates the chemical, physical, mechanical, and high temperature properties of 4 nickel-base alloys. **Haynes Stellite Co., Div. of Union Carbide Corp.,** Lexington Ave., New York, N.Y.

ABRASION RESISTANT STEEL. (Bulletin 11-3) Describes the composition for hardness and ductility of sheet and plate abrasion resistant steel. **J. T. Ryerson & Son Inc.,** Box 8000-A, Chicago, Ill.

AIR BRAKE OPERATOR FOR VALVES. (Bulletin V-604) Catalogues a complete line of Westinghouse air brake power operators for actuating Rockwell-Nordstrom screwed-gland, and wrench type valves. **Meter & Valve Div., Rockwell Mfg. Co.,** 400 N. Lexington Ave., Pittsburgh, Pa.

CONVEYOR STRIP. (Form #FT-57) Gives application ideas and features of Rapistan Flow Track gravity conveyors. **Rapid-Standard Co., Inc.,** 342 Rapistan Bldg., Grand Rapids, Mich.

PVC VALVES, FITTINGS & PUMPS. (Bulletin) Furnishes price information and specifications of the complete line of Mirenda rigid PVC valves, fittings, and pumps. **Mirenda Corp.,** 253 Battle Ave., White Plains, N.Y.

CONVEYOFLO METER. (Bulletin 550-P5) Any belt conveyed material can be accurately, automatically, and continuously totalized and fed by the modified Conveyoflo meter. The technique and equipment is described in this bulletin available from **Builders-Providence Inc.,** 345 Harris Ave., Providence, R.I.

SILICONE MOTOR REWINDS. (Brochure #10-104) The value of rewinding motors with silicone insulation is appraised in dollars and cents terms in a brochure published by **Dow Corning Corp.,** Midland, Mich.

CUSHIONED AUTOMATIC ENGINE STOP VALVES. (Bulletin S-3A) Describes the G-A combined throttle and automatic engine stop valve used with turbines, compressors, or engines to prevent overspeed or runaway. **Golden-Anderson Valve Specialty Co.,** Ridge Ave., Pittsburgh, Pa.

UNIVERSAL FEEDERS. (Bulletin 20-P2) The construction of Omega Universal Feeders, designed to feed any dry material at various rates, is described in an 8 page text issued by **Omega Machine Co.,** Providence, R.I.

SARALOY 898. (Booklet 171-77) Contains detailed information on this flexible thermoplastic, chemical resistant lining material. **Dow Chemical Co.,** Midland, Mich.

CONTROLLED VOLUME PUMPS. (Bulletin #553-1) Gives specifications and latest design features of the complete line of motor driven controlled volume pumps made by **Milton Roy Co.,** 1300 Mermaid Lane, Philadelphia, Pa.

RYKON GREASES. (Bulletin) Relates the properties and applications of the new lubricant. **Standard Oil Co.,** Chicago, Ill.

ASPHALT TILE MAINTENANCE. (Bulletin 1401) In step by step instructions, tells rules for initial treatment, daily maintenance, and restoration of all types of asphalt tile floors. **Multi-Clean Products Inc.,** St. Paul, Minn.

STRONG STEAM SPECIALTIES. (Catalog #69) Descriptions, illustrations, dimensions, capacities and prices of Strong steam traps, strainers, separators, and valves are contained in its 60 pages. **Strong, Carlisle & Hammond,** 1392 W. 3rd St., Cleveland, Ohio.

"BD" OIL COOLERS. (Bulletin 12C) Publishes the complete line of oil coolers manufactured by **Schutte & Koerting Co.,** Cornwells Heights, Bucks County, Pa.

pH ELECTRODES. (Bulletin 86-5) It is designed to guide users in the selection of correct pH electrodes. **Scientific Instrument Div., Beckman Instruments Inc.,** Fullerton, Cal.

BRASS VALVES. (Folder) Emphasizes the advantages of composition disc brass check valves for a broad range of services. Also includes information on globe, angle, and lift check valves. **Crane Co.,** 836 S. Michigan Ave., Chicago, Ill.

SIMONDS SAW & STEEL CO. (Booklet) Chronicles the firm's history for the past 125 years. **Simonds Saw & Steel Co.,** Fitchburg, Mass.

TWO STAGE CENTRIFUGAL PUMPS. (Form 70762-C) Features class GT general purpose centrifugal pumps, in capacities from 100 to 3500 gpm. **Ingersoll-Rand,** 11 Broadway, New York, N.Y.

TRIANGLE RIGID HIGH IMPACT PLASTIC PIPE & FITTINGS. (Technical Catalog) Covers applications, chemical resistance ratings, electrical and physical properties, plus the working pressures for Triangle plastic pipe and fittings. **Plastic Pipe Div., Triangle Conduit & Cable Co.,** New Brunswick, N.J.

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St. Regis Paper Co. installed three more ACCELATOR® treating units, duplicates of a unit installed in 1951, because—in addition to providing treated water of the desired characteristics — the "ACCELATOR" unit produces a calcium carbonate sludge suitable for reburning to provide quicklime for other plant requirements.

To be suitable for reburning, the calcium carbonate sludge should be substantially free from magnesium and silica to prevent the "build-up" of these constituents in other plant processes in which the calcined sludge is used.

The "ACCELATOR" treating unit is particularly well adapted to producing high purity calcium carbonate sludge because it utilizes mechanically maintained slurry recirculation, regardless of through-put. This affords rapid and complete dispersal of the treating chemical into the water slurry mixture, thus avoiding localized over-treatment which precipitates the unwanted magnesium hydroxide with consequent silica absorption.

For producing calcium carbonate "fit to burn" use "ACCELATOR" treating plants as many other Kraft mills have done.

Write for Bulletin 1825.
P.S. The "ACCELATOR" unit is also suitable for clarification and color removal problems.

Inquiries are also invited on all other water and waste treating problems including coagulation, precipitation, sedimentation, filtration, flotation, ion exchange and biological processes.

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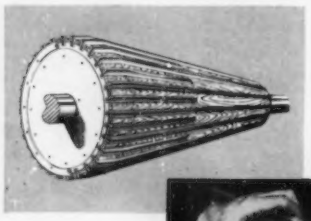

Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

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A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

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NEWS OF CONVERTERS

Wyomissing Becomes Division of Narrow Fabric

The Narrow Fabric Co., Wyomissing Glazed Paper Co., Reading Glazed Paper Corp., and United Manufacturing Corp., all of Reading, Pa., have been merged into one corporation. Samuel R. Fry is president of all three firms. Effective July 1, the companies were merged into a single entity under the name of the Narrow Fabric Co. In addition to Mr. Fry, the board of directors will include Richard C. Wetzel, John W. Sweeney, Thomas P. Handwerk, Roy G. Manderbach, Leroy W. McGrath and Thomas M. Fry.

The paper converting units will operate as a separate division, assuming a new identification, and will be known as the Wyomissing Paper Products Division of the Narrow Fabric Co.

The textile operations of the company have been continuous for 57 years. It manufactures thousands of items in its braiding, weaving, knitting and lace departments. Operations will continue in all plants in their present locations. Mr. Fry stated that no changes are contemplated in personnel or administration.

Management of the new organization expects there will be faster growth, larger opportunity in research and development, and more flexibility in operations of all of the segments by reason of the merger.

Martin Names Sales Dir.

Donald R. Cooper has been appointed director of sales in the head office of Martin Paper Products Ltd. He will be at the new location of the head office: 211 Dayton Building, 323 Portage Ave., Winnipeg, and will be responsible for the coordination of all sales activities of the company.

Mr. Cooper returns to Canada to join Martin after nine years' experience in sales with a large integrated paper corporation, chiefly in the Pacific states of the U. S.

Citrus Container Inst. Moves to Florida

Citrus Container Institute has transferred its offices from Bryn Mawr, Pa., to Lakeland, Fla.

The Citrus Container Institute is an association of corrugated box manufacturers which works to develop proper specifications, packing methods and transportation of corrugated boxes used in the shipping of Florida fresh citrus fruit.

Dixie Stockholders O. K. Merger With Canco

The stockholders of the Dixie Cup Co. at a special meeting on June 19 ratified the merging of Dixie into the American Can Co. A total of 800,657 votes, or 98.5 per cent of those cast, favored the action. Under the terms of the agreement, Dixie stockholders will receive 1.65 shares of American Can common stock for each share of Dixie.

C-Z Transfers Three From San Leandro Plant

From its paper converting plant in San Leandro, Calif., Crown Zellerbach Corp. has transferred the plant superintendent J. D. Cummings to the same position at the Los Angeles converting plant.

Also leaving San Leandro is R. L. Trieman, superintendent of grocery bag converting. He moves to C-Z's Antioch, Calif. plant as superintendent of towel and tissue converting.

Production planning supervisor at San Leandro, Robert Lorenz, moves into the same job at the Antioch plant.

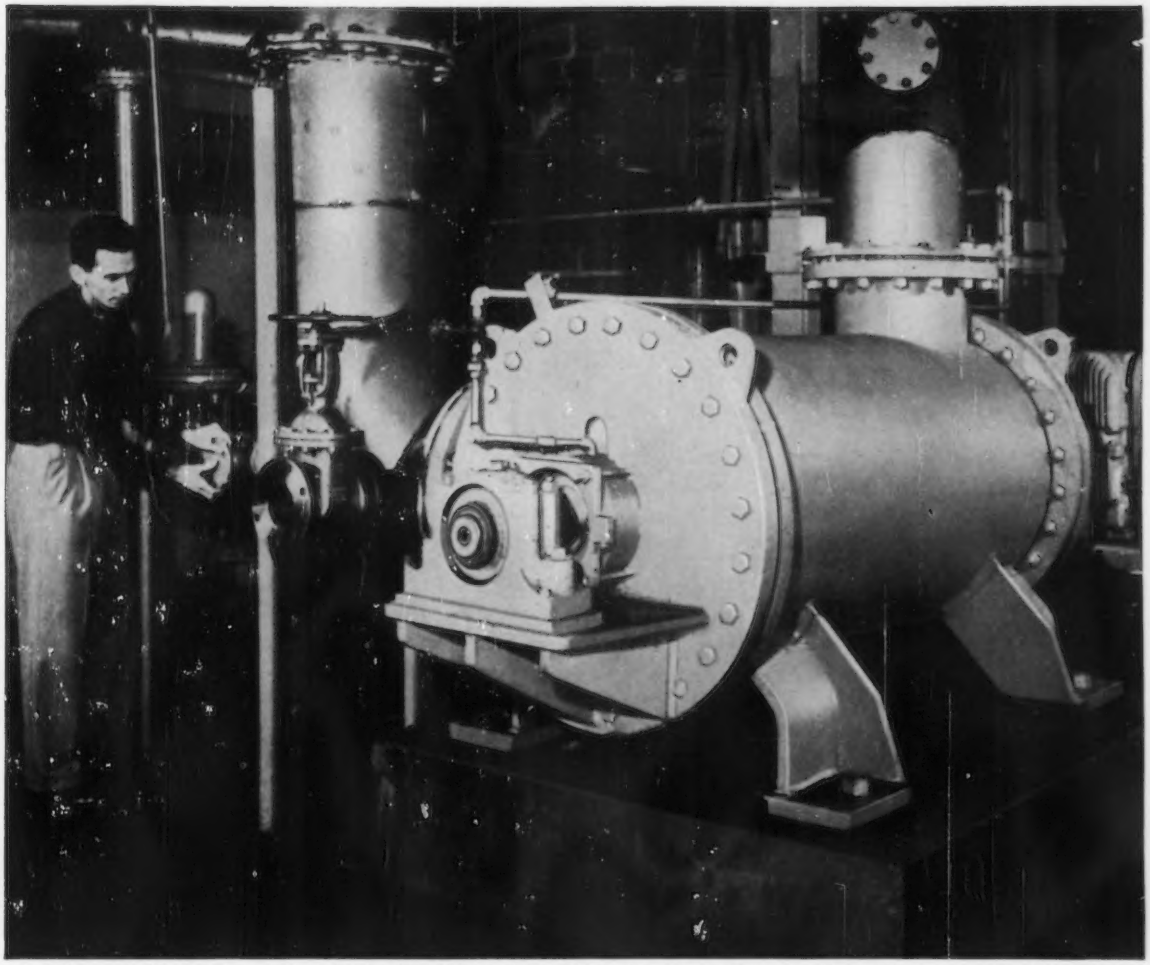
British Converting Covered In New Book

Titled "Paper and Board Conversions, Printers Aids and Hints", this 350 page text by Frederick T. Day reviews converting practices and operations as they are performed in Great Britain. It is comprehensive in its survey of papers, boards and coated materials, cloths, laminated papers, impregnated papers, tissues and the many other papers employed in modern commerce and industry.

Papers for printing, packaging, boxmaking, stationery, and a variety of converting processes are dealt with in a way which will be of special interest to all involved in these trades.

Conversions of basic or body papers to other essential materials are discussed and illustrated while their end product and its ultimate usage are surveyed.

Copies of "Paper and Board Conversions" are priced at $5.00, and may be obtained from the Book Dept., Lockwood Trade Journal Co., 15 West 47th Street, New York 36, N. Y.



Chlorine dioxide mixer in service at the Carolina Division of Riegel Paper Corp. The unit was manufactured by Improved Machinery Inc. It is lined with ⅛" REM-CRU A-70 titanium sheet.

TITANIUM tames chlorine dioxide bleach

Improved whiteness and reduced fibre degradation—they're the benefits of bleaching with chlorine dioxide. But this fine bleach is also a strong corrosive—it's been known to ruin even very special alloys in five hours.

But there's a way out—*titanium*. Extensive tests have shown titanium to be *virtually immune* to chlorine dioxide attack—in fact, titanium parts are still in service after thirteen months' exposure. That's why the new chlorine dioxide mixer, shown above at the Carolina Division of Riegel Paper Corporation, has all contact surfaces made of REM-CRU titanium.

Titanium's unique properties can help solve other pulp and paper mill materials problems, too. It's strong as steel, for example, yet 44% lighter . . . it withstands attack by an extremely diverse group of corrosive media . . . it is immune to stress-corrosion cracking . . . it is not subject to cavitation corrosion and erosion.

No wonder titanium outlasts other materials by as much as 10, 20, even 50 times! Though titanium equipment may cost two or three times more than that made from other materials—*titanium's longer service life rapidly wipes out this cost differential.*

Where materials failures have been eating into profits—think of REM-CRU titanium. A REM-CRU engineer is well qualified to help you work out specific applications.

Write Dept. PT-7 for the Rem-Cru Review—a free periodical presenting the latest data on titanium.

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PAPER PEOPLE

Frederick S. Leinbach

Martin Kirchhoefer

Elected Riegel Exec. V. P.

Frederick S. Leinbach has been elected executive vice president of Riegel Paper Corp. He was formerly vice president and general sales manager. Mr. Leinbach has been with Riegel for 23 years, having started as a chemical engineer for product development in the corporation's mills at Milford, N. J.

Mr. Leinbach is active in the American Paper and Pulp Assn., currently serving as Chairman of its Chemical Additives Committee and is a member of the Export Committee. He recently served as President of the Packaging Institute and, during World War II, was Assistant Director of the War Production Board's Container Division.

Sales managers and department heads formerly reporting to Mr. Leinbach will report to A. P. Mitchell, senior vice president—sales.

Wilson New Manager For Container Corp.

Haldane Y. Wilson has been appointed general manager of the Chattanooga folding carton plant and paper mill of Container Corp. of America.

Wilson has been at the Chattanooga plant since 1953, having served as superintendent of the folding carton plant, assistant manager of both the plant and the paper mill and more recently as assistant general manager of both operations.

Bowen Named Asst. Mgr. At Scott's Chester Mill

William R. Bowen, maintenance engineer for the Marinette Paper Co., Marinette, Wis., has been named assistant plant manager for service at the Chester, Pa., plant of the Scott Paper Co.

Fills New Post at Consolidated Water Power

Martin Kirchhoefer has been named to the new position of industrial engineer by the Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

Mr. Kirchhoefer joined the firm in 1935, and has been purchasing department engineer for the last 12 years.

Coosa President Elected V. P. of Kimberly-Clark

A. G. Wakeman, president of the Coosa River Newsprint Co., has been elected a vice president of Kimberly-Clark Corp.

Mr. Wakeman will continue as president and chief executive officer of Coosa River but administration of the newsprints company will be directed by P. A. Bachelder, recently elected vice-president of Coosa River. Mr. Wakeman will transfer his headquarters to Neenah, Wis., later this year.

Kimberly-Clark is associated with a group of U. S. newspapers in ownership of the Coosa River Newsprint Co. and operates the company under a long-term management contract.

New Treasurer for Beveridge

Dudley V. Sutphin has been elected treasurer of Beveridge Paper Co., Indianapolis, Ind., succeeding Roscoe C. Johnston, who died recently.

State Senator Joins Southland Staff

Texas State Senator Ottis Lock will not seek re-election next year. He is forsaking public service to become assistant to the president of Southland Paper Mills Inc. at Lufkin, Texas.

Gair Plant Shifts Men

The following promotions and transfers have been announced by Robert Gair division of Continental Can Co., at Elkhart, Ind.

Albert F. Bigelow Jr., has been promoted and moved to the Gair plant at Piermont, N. Y., where he will be director of product control. He started with the American Coating Mills in 1942.

Assuming the position in Elkhart as director of production control is Lewis R. Ayers, who has been transferred to Elkhart from Piermont where he held the same job. He replaces Harold Brakewood who died recently.

Mr. Ayers joined the Gair company in 1948. He is a graduate of Syracuse University and the Institute of Paper Chemistry. As product control director he will supervise the quality level of the plant's products in Elkhart.

Taking over Mr. Bigelow's duties in Elkhart as quality control supervisor will be James R. Hurd who has been serving as waste control analyst. Mr. Hurd has been with Gair since 1953.

William F. Robinson is assuming the position of assistant personnel manager at Elkhart. He replaces W. H. Van Horn Jr., who will be promoted and transferred to the Thames River, Conn., plant of Gair.

Joins Marathon Packaging

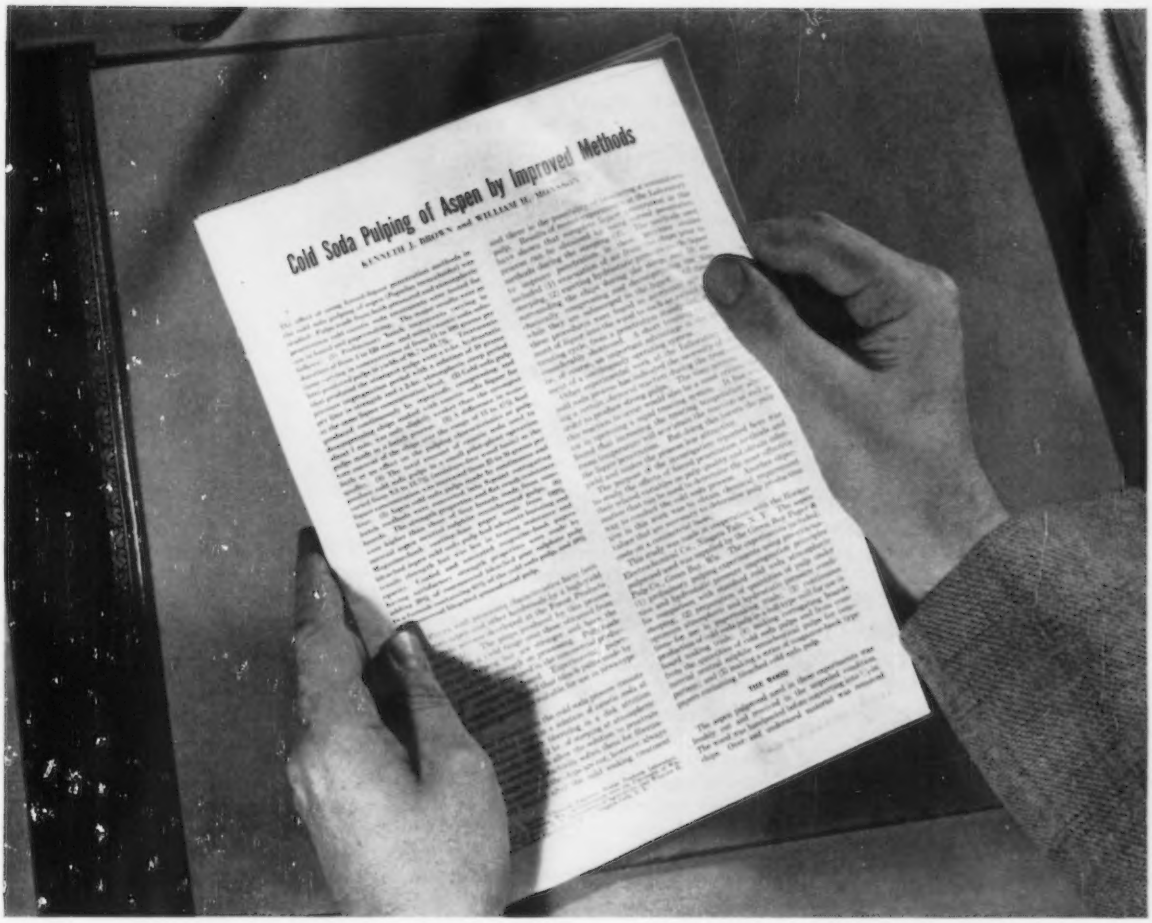
Charles B. Livingston has been appointed sales manager, Folding Division, Marathon Packages Ltd., Toronto.

Greene Named H & D Chief Industrial Engr.

Harry D. Greene, Jr. has been appointed chief industrial engineer for Hinde & Dauch, Sandusky, Ohio. He will be responsible for the establishment and continuation of a company-wide system of methods and standards to be used in the manufacture of corrugated paper products and for the industrial engineering training program.

Hinde & Dauch, a subsidiary of West Virginia Pulp and Paper has fourteen plants located throughout the East, Midwest and South. Its fifteenth plant is now under construction at Meriden, Conn.

Mr. Greene has been with Hinde & Dauch since 1949. He served first as plant industrial engineer at the Hoboken and Gloucester City, N. J. plants and was named assistant to the chief industrial engineer 18 months ago. He steps into the position vacated when Ralph Q. Centola, former chief industrial engineer, was promoted to plant production manager of the Meriden plant.



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"Cold Soda Pulping of Aspen by Improved Methods"

New high-yield process makes uniform cold soda pulp

A new, improved process for steeping aspen pulp in cold caustic soda shows great promise for making corrugating board and news-type papers.

The Forest Products Laboratories with our cooperation put the new process to the following tests:

1. Pre-evacuated aspen chips were steeped in cold caustic soda under hydrostatic pressure. The resulting pulp was compared with standard cold caustic pulp steeped under atmospheric pressure.

Results show that in this process the liquor penetrates the aspen chips completely and produces a highly uniform pulp. Thus the process overcomes the most serious objection to previous methods of cold caustic steeping.

2. 9-point corrugating board was made from cold caustic pulp produced continuously in a roll-type mill and from pulp produced under hydrostatic pressure.

The board shows higher strength properties than four other boards made from commercial neutral sulfite semi-chemical pulp. The new board has above average folding endurance and a flat-crush value of about 32 pounds per square inch.

3. A series of magazine-type book papers was made from the cold steeped pulp.

Results indicate that the new pulp is suitable in every way for news-type papers.

You can look into the economies of this new process by writing for Bulletin 250 (a reprint of the article on cold caustic steeping which appeared in the August, 1956 issue of TAPPI magazine). It discusses the process and its results in detail.

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617-629 Grant Building, Atlanta, Ga.

Haak Elected V. P. Of Great Northern

Robert A. Haak has been elected a vice president of the Great Northern Paper Co. and will have charge of product development. Mr. Haak has been manager of sales of the company. His headquarters will continue to be in New York City.

Heads P & P School at Alabama

D. S. Davis, graduate of Massachusetts Institute of Technology, has been named to head the department of pulp and paper technology at the University of Alabama.

Professor Davis taught chemical engineering at Wayne University and the Virginia Polytechnic Institute and was associated with the Mead Corp. and the International Paper Co.

Dean Robert Dixon Brown in announcing the appointment said the grants to the UA pulp and paper curriculum from Gulf States Paper Corp. total $125,000. These have been supplemented by university funds and facilities.

The university has now constructed complete laboratory facilities for the study of pulp and paper. It offers work towards the bachelor of science degree in pulp and paper technology and the master of science degree in pulp and paper chemistry.

This past year the School of Chemistry offered 12 undergraduate scholarships in pulp and paper and one graduate scholarship.

Pierce Retires As USE Purchasing Head

Theron E. Pierce, general purchasing agent for United States Envelope, Springfield, Mass., for the past 18 years, has retired after 46 years with the company.

Richard R. Rearick, who has been assistant general purchasing agent of United States Envelope since January 1 of this year, will succeed Mr. Pierce.

Mr. Rearick joined the company in 1951.

Mr. Pierce began working for the company in November 1911 in what was then called its Logan, Swift & Brigham Division at Worcester. He has been active in the Purchasing Agents Assn. of Western Massachusetts, serving as its president in 1931.

Zak Promoted in West Linn Maintenance

At the Crown Zellerbach mill in West Linn, Ore., Richard J. Zak has been promoted from senior engineer in the maintenance department to maintenance foreman for the plant.

ABRAHAM LINCOLN JOHNSON (right), oldest active employee and a former papercutter in the Kennebec Mill receives his retirement check from Ottie McCullum, resident manager.

Hudson P. & P. Corp. Employee Retires at 91

Abraham Lincoln Johnson, 91, believed to be the oldest active employee in the paper industry, has retired from the Kennebec Mill of Hudson Pulp & Paper Corp., Augusta, Me. He was born Feb. 11, 1866, nine months after the death of Lincoln.

Mr. Johnson went to work as a paper cutter at the mill 63 years ago when it was owned by the Cushnoc Paper Co. The mill shut down in the depression throwing Mr. Johnson and hundreds of other employees out of jobs.

In 1935, Abraham Mazer, late founder and former chairman of Hudson Pulp & Paper Corp., bought the idle plant and reopened it. Among the first to return to work at the mill was Mr. Johnson.

Promoted by Mead

William Coats Jr., assistant personnel director of the Heald division, Mead Corp., in Lynchburg, Va. since 1954, has been appointed personnel director of the corporation's Harriman, Tenn., mill. He will be succeeded at Lynchburg by Max Parsons of Chillicothe, Ohio.

Consolidated W. P. & P. Adds Staff Artist

Gerald L. Matthews has joined Ahdawagam Division of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wisc., as staff artist. He will continue to operate his art studio in Wisconsin Rapids which he opened in July 1956.

NEWS OF ASSOCIATIONS

New York Pulpmen At Play

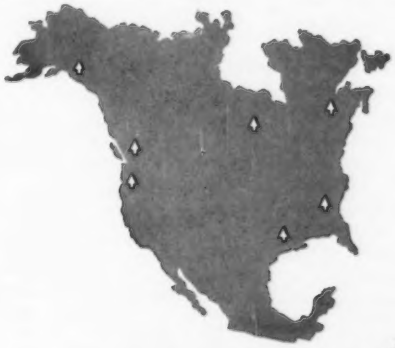
The New York Pulpmen's Golf Assn. held its annual two-day outing in mid June at the Sleepy Hollow Country Club in Westchester County, N. Y. Among the principal organizers of the meeting were (left) Erik Goranson (Cellulose Sales) who received the commemorative President's Cup as he assumes the duties of president for the coming year. Bob Nash (Weyerhaeuser Timber) makes the presentation in the absence of retiring president Karl Clauson (Stora Kopparberg). Tom Salb (Bulkley-Dunton) was program chairman (right) and moves from secretary-treasurer to vice-president. New secretary-treasurer is Howard Peterson (St. Regis).

Plastics-Paper Conference Program

The technical program is near completion for the 12th annual TAPPI Plastics-Paper Conference, which will be held at the Sheraton-Gibson Hotel in Cincinnati, Ohio, on October 7-9.

John F. Blais of Catalin Corp. of America, chairman of the Technical Program Committee, has listed the following papers to be presented: "Impregnation of Paper with Acrylic Emulsions" by E. J. Sweeney, Rohm & Haas. "Latex Treatment of Paper" by E. K. Thommon and V. T. Stannett, the New York State College of Forestry. "Synthetic Fibre Papers" by Hanns F. Arledter, Hurlbut Paper Co. "High Density Polyethylene Coatings" by Arthur E. Irvine and Harold A. Arbit, Bakelite Co. "Silicone Paper Coating" by Joseph W. Keil, Dow-Corning Corp.

The technical program for the second day will include papers on "Saturating Kraft Papers" by Walter Hearn, Brown Co. "Phenolic Resin Bushing and Core Winding" by W. R. Penrod, of Dilts Div., Black-Clawson Co. "A New Test for Post-Formability of High-Pressure Laminates" by Curtis Elmer, Monsanto Chemical Co. "Factors Influencing the Performance of Melamine Laminating



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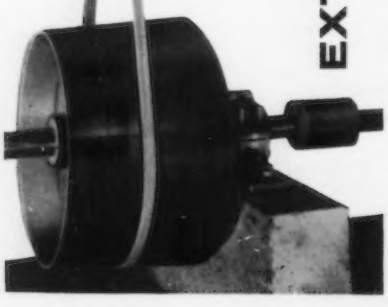

Resin" by H. P. Ledden and I. H. Updegraff, American Cyanamid Co. R. H. Doughty, Fitchburg Paper Co., will present a paper on saturating alpha papers, although he has not, as yet, selected a title.

To Attract More Trained Workers

An informative brochure just published titled, "A Career in Pulp and Paper" will be distributed to high school students throughout British Columbia this fall.

This booklet contains several illustrations and reproductions of photographs of the several occupations in the pulp and paper industry. The text impresses on the student the value of an adequate education and specifies the types of scholastic and academic training required for the various occupations in all divisions of the Industry.

The brochure was prepared by and published for the British Columbia Division of the Canadian Pulp and Paper Assn.

Alkaline Pulping Conference Scheduled for Nov. 6-8

The 11th Alkaline Pulping Conference which will be held in Charleston on November 6-8, will be sponsored by the Alkaline Pulping and Semichemical Pulping Committees. H. Y. Charbonnier is chairman of the Alkaline Pulping Committee and D. O. Adams of the Semichemical Pulping Committee. Chairman of the Local Arrangements Committee is Vincent P. Kane of the West Virginia Pulp & Paper Co., Charleston, S. C. John McK. Limerick, Bathurst Power and Paper Co., Bathurst, N. B., has been appointed technical program chairman and David Wetherhorn, Southern Paperboard Co., Port Wentworth, Ga., will serve as publicity chairman.

F. E. May Celebrates 50 Years in Industry

The Writing Paper Manufacturers Assn., at its recent meeting at the Westchester Country Club, Rye, N. Y., honored F. E. May, president of Rising Paper Co., Housatonic, Mass. on his 50th anniversary in the paper industry. The association presented him with an inscribed silver cigarette box.

Mr. May entered the Strathmore Paper Co., West Springfield, Mass., in 1907. He transferred to the Rising Paper Co. in 1929 and became president of the company in 1947. Mr. May served on the Executive Committee of the Writing Paper Manufacturers Assn. for several years.

PRICES OF MATERIALS

Aluminum sulphate:			
coml, bulk, c.l. wks.	cwt.	$1.85	/ 2.05
iron-free, c.l. wks.	cwt.	3.55	/ —
Casein, acid prec.:			
dom. sh. pt. c.l. (30 mesh)	cwt.	56.00	/ —
Arg. ex. dock, duty paid	cwt.	24.75	/25.50
New Zealand, do.	cwt.	27.25	/27.75
Caustic soda:			
c.l. wks. solid, 76%	cwt.	4.30	/ —
flak. & grd. drums, c.l.	cwt.	4.70	/ —
liquid 50% tanks		2.90	/ 3.00
liquid 73% tanks		3.00	/ 3.10
China Clay			
dom., dry-grd., airfloat:			
325 mesh bgs., c.l. Geo.	ton	10.00	/ —
300 mesh, bgs., c.l. Geo.	ton	13.50	/14.50
imp., white, lump, c.l. ex. dock		20.00	/35.00
Chlorine:			
single-unit tanks, works	cwt.	3.15	/ —
multiple unit, 2-5 cars per yr.		5.25	/ 4.05
Formaldehyde:			
37% (inh. 8% methanol) USP:			
drums, c.l. dlvd.	lb.	.0715	—
tank-cars dlvd	lb.	.045	/ —
Lime:			
hydrated, bulk, c.l. N.Y.	ton	22.32	/ —
quicklime, bulk, c.l. N.Y.	ton	20.82	/ —
Gum rosin:			
K, M, N, drums, c.l. Savan,	cwt.	7.45	/ 7.55
Rosin size:			
70%, gum & pale paste, tank cars, south. sh. pt.	cwt.	7.44	/ 7.48
Saltcake:			
dom. bulk, 100% anh. wks.	ton	28.00	/ —
Soda ash:			
light, 58% ash bags, wks.	cwt.	1.85	/ —
bulk, c.l. wks	cwt.	1.55	/ —
Sodium peroxide:			
dms., c.l. E. of Miss.	lb.	.20½/	—
l.c.l. (same basis)		.21	/ .21½
Sodium silicate, 40° Be.:			
tank-cars, wks.	cwt.	1.20	/ —
drums, c.l. wks.	cwt.	1.55	/ —
(47°) Be. WW.			
tank-cars, c.l. wks.	cwt.	1.90	/ —
drums, c.l. wks.	cwt.	2.25	/ —
Soybean, protein:			
chem. isol., wks. c.l. bags	lb.	.23	/ —
Starches:			
corn, multiwalls, c.l. prod. plant:			
pearl	cwt.	6.49	/ 6.75
white, dextrins	cwt.	8.08	/ 8.20
chlorinated	cwt.	8.25	/ 8.35
potato, Idaho, c.l. wks.	cwt.	6.50	/ —
East, fr. all. 50 cents cwt.			
potato, Maine, f.o.b. wks.	cwt.	6.25	/ —
Sulphuric acid:			
60° Be. chys. c.l. wks.	cwt.	2.00	/ —
l.c.l. wks.	cwt.	2.45	/ —
tank-cars, wks.	ton	18.60	/ —
Sulphur:			
crude, c.l. mines, contract,	long ton	26.50	/ —
f.o.b. vessels Gulf dock	ton	28.00	/ —
Sulphur dioxide:			
liquid, coml, cyl., wks.	lb.	.10	/ .12
multi-unit cars, wks.	lb.	.0535/	—
Talc, fibrous grd., bags:			
c.l. wks., N.Y.	ton	28.00	/ —
l.c.l. wks., N.Y.	ton	31.00	/36.00
Titanium dioxide:			
anstase, c.l. dlvd. E. bags.	lb.	.25½/	—
l.c.l. dlvd.	lb.	.26½/	—
rutile, c.l. dlvd.	lb.	.27½/	—
l.c.l. dlvd.	lb.	.28½/	—

PRICES OF FIBERS

MARKET WOOD PULP

SECOND QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$$83.00/ 86.00‡	$$92.00/ —	$$77.50/ 90.00
Kraft, Blchd.	152.00/155.00	155.00/ —	$155.00/ —		$155.00/ —
Kraft, Blchd. Hdwd.	150.00/ —		$137.00/ —		
Kraft, Semi-bleached	140.00/ —	135.00/140.00	$135.00/140.00‡	*137.50/142.50	
Kraft, Unbl.	117.50/125.00	120.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	150.00/ —	130.00/ —	*150.00/ —	*150.00/ —	145.00/147.50†
Sulphite, Unblchd.	130.00/ —	130.00/ —	†130.50/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		129.00/ —	†129.00/ —		
Soda, Blchd.	142.50/145.00	145.00/ —			

‡ On Dock Atlantic Ports. * Freight allowed. Varying Freight Allowances†

NEW YORK RAG MARKET

New Domestic Cotton Cuttings
Delivered Mill Basis
PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.00/ 16.75
Blchd. & Unblchd. Underwears	15.00/ 15.50
No. 1 Light Silesias	7.00/ 7.50
No. 1 Light Blue Overalls	7.25/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.50/ 6.25
Cottonades	3.25/ 3.75
No. 1 Washables	2.50/ 2.75

Old Domestic Cotton Rags
(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.25
Cotton Pants & Overalls	2.00/ 2.25
Twos and Blues, Repacked	1.50/ 1.75
No. 2 Roofing	.60/ .70

COTTON LINTERS

Memphis Market
f.c.b. Oilmills

Week Ended June 24		Per 100 lbs.
Grade 1	n.a.	
2	1 cut—felting	$9.50/ $9.25
3		9.25/ 8.50
4		8.25/ 7.50
5		7.50/ 7.00
6		6.50/ 6.00
7		6.00/ 5.75

*Based on 73% cellulose.

Old Rope & Bagging
(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$5.75/$6.50
Scrap Burlap	4.50/ 5.25
Australian Wool Pouches	5.25/ 5.75
Gunny	5.50/ 6.25
No. 1 Domestic Manila Rope	7.75/ 8.25
No. 1 Foreign Manila Rope	6.25/ 6.50
Domestic Sisal Strings	4.25/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	June 24	June 24	June 24	June 24
No. 1 Mixed Paper	$4.00/ 6.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	10.00/ 12.00	11.00/ —	12.00/ —	11.00/ —
Overissue News (Lg. size)	13.00/ 16.00	9.00/ 12.00	17.00/ —	13.00/ —
Mill Wrappers	12.00/ 14.00	11.00/ 12.00	7.00/ —	13.00/ —
Old Corrugated Containers	15.00/ 17.00	15.00/ 16.00	22.00/ —	18.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 36.00	30.00/ —	45.00 —
New Double Kr. Ld. Corr. Cuts (Semi-chem. medium)	25.00/ 30.00 40.00/ 45.00	30.00/ 35.00 40.00/ 45.00	35.50/ — 40.00/ 45.00	30.00/ — 40.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	40.00/ —
New Br. Kraft, Env. Cuts	65.00/ 75.00	75.00/ 80.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	60.00/ 65.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	70.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	22.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	45.00/ 55.00	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 65.00	60.00/ 65.00	60.00/ —	— / —
Super Soft White Shvs.	65.00/ 70.00	70.00/ 75.00	70.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/105.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	110.00/120.00	115.00 125.00	95.00/ —	100.00/110.00
Col. Tab. Cards	45.00/ 50.00	50.00/ 55.00	47.50/ —	30.00/ —
Manila Tab. Cards	60.00/ 65.00	65.00/ 75.00	65.00/ —	49.00/ —
No. 1 Col. Ledger	30.00/ 32.00	30.00/ 35.00	40.00/ —	27.50/ —
White Ledger	50.00/ 55.00	50.00/ 55.00	55.00/ —	35.00/ 40.00
Mixed Book & Mag.†	18.00/ 20.00	19.00/ 20.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	24.00/ 26.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

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NEWS OF SUPPLIERS

Clark Equipment Co. has appointed four district sales managers for its Industrial Truck Division, which manufactures fork trucks, straddle carriers, etc.

Marvin B. Dickey has been appointed manager for a midwest district covering Clark dealerships in Detroit and Grand Rapids, Mich., South Bend, Ind., Toledo, Ohio, and Toronto, Ontario. He came to Clark when the firm purchased Ross Carrier Co. in 1953 and since then has been sales manager of the Carrier Division.

Earl F. Patterson has been named manager of a northeast district covering all of New England, Albany, Syracuse and Buffalo, N. Y., and Montreal, Quebec. He has held various sales positions with Mobilift Corp., Continental Transportation Lines and Trailmobile Corp.

William C. Portman will be manager of an east central district covering Ohio, Pennsylvania, West Virginia and Virginia. He has been a vice president of William Doepke Manufacturing Co., Cincinnati, with duties including sales supervision of the firm's materials handling and machine tool divisions. Prior to that he was with the Cincinnati distributor of Yale & Towne equipment.

R. W. Self will manage a midwest district covering Clark dealerships in Minneapolis, Minn., Davenport and Des Moines, Iowa, Omaha, Neb., Kansas City and St. Louis, Mo., and Evansville and Indianapolis, Ind. For the past three years he was with Clark's St. Louis distributor. Prior to that he was with the Yale & Towne dealer in that city, and the Storage Battery Division of Thomas A. Edison Co.

Bristol Co. has recently moved its Pittsburgh District Office to a new building at 2250 Noblestown Rd. The new building will house the sales and service staffs. District manager is L. B. Lumpkin.

Charles R. Stevens, Inc., manufacturer of automatic sheet counters and markers, has moved into new and larger quarters at 501 W. Sophia St., Maumee, Ohio, a suburb of Toledo.

J. W. Juckett

J. W. Joslyn

L. G. Gallup

A. J. Parent

L. G. Brockelsby

A. A. Lowe

M. F. Hayes Jr.

Sandy Hill Iron & Brass Works has elected J. Walter Juckett president and general manager succeeding his father, Frank A. Juckett, who died on May 14.

Walter Juckett had been associated with his father in the management of Sandy Hill since 1936. From 1930 until 1936 they had operated a New England paper mill together. At the time of his father's death he had been secretary-treasurer and general manager of Sandy Hill.

The following appointments are also announced: J. Wesley Joslyn, first vice-president; Loren G. Gallup, vice-president in charge of sales and manufacturing; Arthur J. Parent, vice-president and comptroller; L. G. Brockelsby, secretary and treasurer; Allen A. Lowe, assistant vice-president; and Millard F. Hayes Jr., manager, international engineering division. In addition, Mr. Gallup was elected to the Board of Directors.

Walter Juckett has travelled extensively in Sandy Hill's interest. Recently

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BOSTON 16, MASS. 316 Stuart Street
SPARTANBURG, S. C. Montgomery Bldg.

he spent two months in Korea completing plans and arrangements for a complete paper mill which Sandy Hill will design and equip for Korea's Government Printing Agency. He has been an associate member of TAPPI since 1930 and has occasionally contributed to its technical panels.

Mr. Joslyn joined Sandy Hill as a sales engineer in 1936. He was elected a vice-president in 1942 and became a member of the Board of Directors in 1944. He has been particularly responsible for sales, engineering and development research.

Mr. Gallup has been assistant vice-president in charge of sales and manufacturing since 1954. He became associated with Sandy Hill in 1924. For a short time he was on loan to the Union Bag Co. in an engineering and supervisory capacity.

Mr. Parent came to Sandy Hill in 1942. He was instrumental in forming the Sandy Hill Associates Credit Union and he served as its treasurer for 11 years before becoming its president this January.

Mr. Brockelsby became associated with Sandy Hill in January 1943, as supervisor of procurement and government regulations controls.

Mr. Lowe came to Sandy Hill in 1936. He has since been concerned with sales, advertising and development of new products.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Ass'n. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	May 18	May 25	June 1	June 8	June 15
1957	95.1	93.9	89.8	93.4r	94.1
	May 19	May 26	June 2	June 9	June 16
1956	100.3	101.9	99.6	101.2	100.1

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	94.1‡	96.5‡	96.3‡	93.0‡	93.6‡								
1956	99.6	102.6	102.9	102.5	101.8	99.9	85.6	96.7	94.3	99.5	97.6	90.9	97.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1950	1951	1952	1953	1954	1955	1956	1957
Year to Date	95.7	101.7	93.9	94.2	93.6	95.8	101.3	95.0
Year Average	95.8	98.0	88.6	92.3	91.6	94.9	97.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.
Note: In the above tables all the ratios shown are on the basis of a normal 6 and 7 day capacity.

PAPERBOARD OPERATING RATIOS†

COMPARATIVE WEEKLY SUMMARIES

	May 18	May 25	June 1	June 8	June 15
1957	95	95	88	86	94
	May 19	May 26	June 2	June 9	June 16
1956	97	99	91	97	99

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	91	94	94	92	93								
1956	100	100	99	100	99	98	77	95	89	96	93	84	94

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Ass'n. Figures

ITEM	THIS WEEK ENDING June 15, 1957	LAST WEEK ENDING June 8, 1957	CUMULATIVE TO DATE Jan. 1 to June 15, 1957
% Activity	94%	86%	93%
	Tons	*Tons*	*Tons*
Total Production	287,444	263 469	6,516,595
Liner	96,328	97,736	2,241,499
Corrugating Material	44,439	39 845	986,611
Chip & Filler Board	5,474	4,334	128,806
Total Containerboard	146,241	141,915	3,356,916
Folding	49,151	45,288	1,206,245
Set-Up	10,737	10,491	269,141
Special Food Board	28,469	25,567	575,237
Other	52,846	40,208	1,109,056
Total Boxboard	141,203	121,554	3,159,579
Total Orders	*Tons*	*Tons*	
Received	254,633	323,485	
Unfilled End of Week	419,664	455,338	

POIRIER
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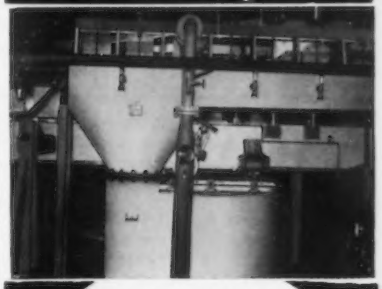

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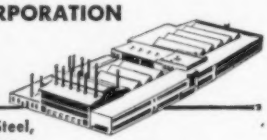

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OPPORTUNITIES—$1.25 a line. Minimum charge $5.00.

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If box number is used—75 cents additional

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 18, N. Y.

Help Wanted

POSITIONS OPEN— MEN WANTED

WE CAN PLACE—Manager large Cylinder and Fourdrinier (northern) paper mill; supt. kraft pulp mill (South); asst. mgr. Cylinder and Fourdrinier mach. mill (northern states); supt. Fourdrinier mach. semi-chemical corrugated medium, Midwest; asst. plant mgr. Cylinder and wet mach. board mill (northern states); office mgr. previously connected with paper converting or envelope mfg. plant; asst. mgr. Fourdrinier mach. paper mill.

Chemists for mills and for demonstrating and selling; electrical engineer; master mechanics; plant engineers; time study-industrial engineers; salesmen to sell paper also mechanical equipment, chemicals and adhesives; paper cup and container mfg. supervisors; designers paper and pulp mill machy.; Cylinder and Fourdrinier four bosses.

SEND US YOUR RESUME if available. It will be in confidence.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St. Boston 8, Mass.
Phone Liberty 2-6547

J-1

PAPER MILL SUPERINTENDENT

We are looking for a Superintendent for our new paper mill. This mill will produce a variety of Fourdrinier bleached boards and specialties. This is an outstanding opportunity for a man whose previous successful experience qualifies him to take charge of the paper mill from stock preparation through finishing and shipping.

PERSONNEL DEPARTMENT
RIEGEL PAPER CORPORATION
CAROLINA DIVISION
ACME, NORTH CAROLINA

JI-8

Help Wanted

PAPER MEN

$5,000 to $50,000

SALES—PRODUCTION—TECHNICAL

Top mills, converters, and jobbers from Coast to Coast badly need qualified men at every level. Choice spots open in pulp, board, coarse, fine, folding, corrugated multi-wall bags, transparent packaging and paper specialties of all kinds.

I am a paper man myself. If your record of performance entitles you to increased responsibility and greater potential, I can and will help you to attain it. You may contact us in absolute confidence.

GEO. M. SUNDAY & ASSO.
Personnel Consultants to the Paper Industry
6 E. Monroe, Chicago AN 3-1970 TF

Sales and Production personnel are needed for several Pure-Pak carton plants to be located in various parts of the country. Please communicate with Potlatch Forests, Inc., Dairy Service Division, 20 North Wacker Drive, Chicago 6, Illinois.

TF

EXPERIENCED NIGHT TOUR BOSS FOR SMALL OHIO PAPER BOARD MILL. FULLY ACQUAINTED IN ALL PHASES OF SPECIALTY PAPER BOARDS AND SOME KNOWLEDGE OF MECHANICS. EXCELLENT OPPORTUNITY FOR AMBITIOUS MAN. OUR EMPLOYEES KNOW ABOUT THIS AD. WRITE BOX 57-148 CARE PAPER TRADE JOURNAL. JL-1

MECHANICAL ENGINEER

Graduate Mechanical Engineer experienced in the operation of Fourdrinier paper machines, refining and related equipment for large expanding and progressive mill in Middle Atlantic States. Under 35 years of age. Good salary and excellent opportunity for advancement. Give detailed resume of experience. Send resume to

Director of Personnel
West Virginia Pulp & Paper Co.
Luke, Maryland J-1

Help Wanted

Personnel Service Associates
H. M. Grasselt, Manager
115 State St., Springfield 3, Mass.
Tel. RE 6-4749

Personalized Procurements & Placements
Efficient and confidential service to employers and employees in the Paper and allied fields.
Administrative—Technical—Production—Sales
Inquiries welcome

J-1

DESIGNERS—DRAFTSMEN

Experienced Designers, Draftsmen for design and installation of Pulp and Paper manufacturing machinery in large expanding and progressive mill. Usual benefits with excellent opportunity. Send detailed resume to

Personnel Manager
West Virginia Pulp & Paper Company
Luke, Maryland J-1

MILL SALES MANAGER

NEW ENGLAND

$17,500 to $25,000

Plus Profit Sharing Bonus

We have been engaged by the President of a very well known FINE AND MEDIUM FINE SPECIALTIES mill in New England to aid in the selection of a top flight sales executive able and willing to assume full responsibility for all marketing activities.

Historically, this mill has run standard fine grades on its two Fourdriniers, but is becoming increasingly active in medium fine specialties—principally direct process papers and other custom made grades. At present, about 20% of the total dollar volume is outside the graphic arts field. Top management wants to increase it to 50%. All tonnage marketed direct. No jobbers.

This is an exceptional career opportunity for a hard-hitting, ambitious, creative-minded merchandiser in the 35-50 age bracket capable of programming for and leading the way to at least $1,000,000 in new specialty business. Unlimited earning potential. Right man can become Vice President of Sales in near future.

Reply in absolute confidence to arrange personal conference at our expense.

GEO. M. SUNDAY & ASSOC.
Paper Industry Consultants
6 E. Monroe Chicago An 3-1970

J-6

Editorial Positions Open

PAPER TRADE JOURNAL is expanding its editorial staff and has several positions open. Require some knowledge of pulp and paper manufacture or converting operations and a general interest in the industry. Send résumé to Editor, PAPER TRADE JOURNAL.

FOR SALE

BARKING DRUM
Write us regarding your requirements.

BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54" x 48", cast iron tubs.
1—Bertram beater roll 72" dia. x 63" face, hollow mid-feather, cast iron tub.

BREAKER STACK
Write us regarding your requirements.

CALENDER STACKS
1—3 roll 30" face friction Calender Stack (Holyoke), 2 iron rolls, 1 cotton roll and 1 spare cotton roll.
1—3 roll 84" calender stack.
1—4 roll 72" Calender Stack. (Extra heavy duty).
1—5 roll 82" face.
1—5 Roll 86".

CHIPPERS
1—96" Murray 4 knife Chipper—anti-friction bearings.
24—Chipper Knives 15⅜ x 8¼, 2 slot.

CLASSIFINER
1—Dilts Classifiner, practically new.

CONVEYOR
1—Corrigan slush maker conveyor, 72" wide.

CORE MACHINES
Write us regarding your requirements.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.

CYLINDER MOLDS
1—42" diameter x 134" face with anti-friction bearings.
2—30" diameter x 72" face.
1—30" diameter x 92" face.
1—36" diameter x 84" face.
2—36" diameter x 110" face.
3—36" diameter x 90" face, 18" diameter couch rolls.

DIGESTERS
1—Biggs 12' 6".
Write us regarding your requirements.

DRIVES
1—Rice Barton hypoid drive, 4 to 1 ratio.
1—#6 Reeves horizontal—anti-friction bearings.
1—#6 Reeves vertical anti-friction bearings.
1—Sandy Hill right angle 50 H.P. (4.75 to 1)
1—Farrel Birmingham enclosed drive, 200 H. P. anti-friction bearings, 5.45 to 1, new equipment.
1—Jones 21 H. P., ratio 10 to 1 (enclosed angle drive).
1—#4 Reeves Drive.
1—#4 Reeves Drive totally enclosed Class E with 25 HP splash proof motor.
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 H.P.).
3—Rice Barton enclosed drives, double reduction (14 to 1 one end, 4 to 1 other end).

DRYERS
4—48" diameter x 52" face with frames, gears, bearings.
1—24" diameter x 54" face, with bearings (steel).
4—28" diameter x 80" face with anti-friction bearing.
1—36" diameter x 44" face.
5—36" diameter x 76" face.
2—Dryers 36" diameter x 84" face, with bearing gears.
6—36" diameter x 80" face.
36—42" diameter x 118" face, complete.
22—28" diameter x 40" face with frames, gears and felt rolls.
1—16" diameter x 54" face (steel).
1—48" diameter x 66" face.
1—60" diameter x 89" face, frames and bearings.

DYNOFINER
"Rice Barton," details on request.

EMBOSSING CALENDERS
1—43" 3-Roll Embossing Calender.
1—45" Meadows 2 roll embosser.
3—62" 2 Roll embossers.

EXTRACTOR ROLLS
1—Extractor roll, 26" diameter x 104" face
1—Rice Barton & Fales Extractor Roll, 26" diameter x 104" face.

FELT CONDITIONER
Write us regarding your requirements.

FELT ROLLS
50—Brass Felt Rolls with Brass Journals. 72" face x 5" dia.

FLAT SCREENS
1— 8 Plate "Packer."
1—12 Plate "Packer."

GEARS
Write us regarding your requirements.

GRINDERS
2—3 pocket Grinders.

HYDRAFINER
1—Dilts, stainless steel filling, anti-friction bearings, excellent condition.

HYDRAULIC PRESS
1—750 ton hydraulic pulp press.

JORDANS
1—Noble & Wood Mammoth.
Write us regarding your requirements.

KNIFE GRINDER
1—Rogers 128" knife grinder.

LABORATORY EQUIPMENT
1—Ball Mill.
1—Electric Oven (Williams Standard Pulp Testing Apparatus).
1—2 ft. Shartle Hydrapulper.
1—36" Somat Pulping Machine.
1—Williams Centrifuge.
1—Colloid mill.
1—6" x 6" sheet mold.
1—8" x 8" sheet mold.
1—8" x 8" sheet dryer.
1—12" x 12" sheet dryer.
1—Schopper fold tester.

LAMINATING MACHINES
1—72" Beloit Laminator, complete with drive.
1—26" Polyethylene laminator.
2—84" Asphalt laminators.

MISCELLANEOUS
1—#1 Miami Selectrap.

MOTORS
2—100 h.p. G. E. Upright—1180 r.p.m.
1—300 h.p. Slip Ring Motor—500 r.p.m.—Rebuilt.

PRESS ROLLS
2—Chilled Iron, chrome plated, 9" x 72".
2—Chilled Iron, chrome plated, 14" x 72"
1—Chilled iron, chrome plated, 12" x 100"
1—Chilled iron, chrome plated, 10" x 74"
8—Sets (1 rubber, 1 chrome steel) 74" face x 16" dia. Complete with bearings.

PULLEYS
Various cone and assorted pulleys.

PULPERS
Write us regarding your requirements.

PUMPS
1—Shartle Bros. high density pump, 2000 g.p.m., 62 ft. head
2—Five stage Centrifugal Boiler Feed Pumps. 160 g.p.m., 1025 ft. head.
1—Ingersoll Rand Fan Pump, 10,000 g.p.m. —25 ft. head, anti friction bearings—like new.
Various sizes of Centrifugal and Plunger Pumps.

RAG CUTTERS
Write us regarding your requirements.

REELS
1—86" 2 bowl reel
1—84" 3 bowl revolving reel.
1—100" Rice Barton 2 bowl Reel, heavy duty.
1—123"—3 bowl revolving reel.
1—134"—2 drum.
1—72" Downingtown Reel, 2 bowl.

REFINERS
1—12" Wiener Refiner.
1—#2 Claflin refiner.

REGULATOR
1—Bird Consistency Regulator.

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.).

ROTARY SCREENS
1—#1A Bird, copper vat.
2—APMEW Rotary Pulp Screens.

SAVEALLS
1—#5 Bird Saveall.

SCREEN PLATES
Bird Rotary screen plates.
Write us regarding your requirements.

SHEETERS
1—85" Hamblet (Duplex), 8 roll backstand.
1—46" Hamblet.
1—124 Moore & White (duplex) sheeter, 4 pile layboy and 6 roll backstand.
1—130" Hamblet Heavy-Duty.
1—140" Hamblet (Simplex).
1—140" Hamblet (Duplex).
1—150" Hamblet duplex sheeter & layboy.
1—78" Moore & White Co. Sheeter (Simplex), layboy and 6 roll backstand.
1—130" Hamblet (Duplex), backstand and layboy, anti friction bearings.

SHOWERS
Write us regarding your requirements.

SHREDDER
1—Mitts & Merrill air-fluff excelsior paper shredder, with motor. Excellent condition.

SLITTERS & WINDERS
1—32" Cameron Type 9.
1—42" Cameron Type 9.
3—42" Cameron Type 6.
1—42" Cameron Type 26-2A.
1—50" Cameron Type 6.
2—52" Cameron Type 10.
1—62" Cameron Type 6.
1—62" Cameron Type 10-10.
1—72" Cameron Type 10-14 (60" rewind).
1—72" Cameron Type 10.
1—152" Cameron Type 18.
1—40" Langston.
1—40" Fales Slitter.
1—86" Two Drum Moore & White 50" diameter rewind.
1—120" Moore & White 4 drum winder.
1—96" 4 drum Moore & White winder.

SLITTING DEVICE
84"—Quick change slitting device shear cut, complete, practically new.

STEAM JOINTS
18—3" Johnson steam joints (new).

STOCK MAKER
1—Morden Stock Maker (with motor).

STOCK PUMPS
1—Union centrifugal stock pump, 4" x 6", all bronze, with totally enclosed motor.
1—8 x 18 Shartle Triplex.
1—10 x 20 Shartle Triplex.
1—12 x 20 Shartle Triplex.

SUCTION BOXES
Write us concerning your requirements.

SUCTION COUCH SHELL
1—Downingtown suction couch shell only, 127½" face x 26" diameter.

SUCTION COUCH ROLLS
1—36" diameter x 248" face, SKF bearings.
1—Sandusky Suction Couch Roll 18" diameter x 98" face.
1—Sandusky Suction Couch Roll 108" face x 24" diameter, including spare shell.

SUCTION FELT ROLLS
1—Gilbert & Nash 122" face.
1—Beloit Rubber Covered Suction Felt Roll 109" face x 20½" diameter.

SUCTION PRESS ROLLS
Write us regarding your requirements.

SUPER CALENDER STACK
1—9 Roll 56"

TABLE ROLLS
22—Rubber Covered 10" diameter x 246" face.
30—4" dia. x 130" face (will cut to size).

THICKENERS
1—Pusey & Jones, 42" x 146" face cylinder mold, 18" diameter couch roll. Complete with iron end wood vat.

TOILET WINDERS
2—72" Hudson-Sharp (Surface type winder).

TRIMMERS
Write us regarding your requirements.

TURBINE GENERATOR SET
1—150 kw General Electric.

VACUUM PUMPS
1—#6 Nash hytor.
2—L-4 Nash vacuum pumps.
2—L-5 Nash vacuum pumps.
1—K-4, Motor equipped.
4—#1 Nash Hytor vacuum pumps.
1—#7 Nash Hytor, complete with 75 h.p. synchronous motor.
1—#4 Nash Hytor Vacuum Pump.
2—Connersville, 14 x 20.

VALVES
8—10" 3-way DeZurik Dump Valves.
6—12" 3-way DeZurik Dump Valves.

VATS
2—D. J. Murray Company Vats, iron ends, for 42" x 120" cylinder molds, overflow and counterflow.

WET MACHINE
1—72" Wet Machine.

YANKEE DRYERS
1—84" diameter x 56" face.
1—140" face x 12 ft. diameter, bearings and stands.
1—60" diameter x 89" face, frames and bearings.

Paddy Ross, Pres.
377 Frelinghuysen Ave.*

J. J. ROSS COMPANY

Tel.—Bigelow 3-3720

Ben Kurs, Treas.
Newark 5, N. J.

Help Wanted

DIVISIONAL WOODS SUPERINTENDENT

Wanted for pulpwood and saw log operations and to assist in timberland management in the State of Maine. Experience necessary with Forestry training preferred. Must speak fluent French and English. Write Box 57-162 care Paper Trade Journal, giving full particulars, including experience and references. J-1

SALES ENGINEER

PAPER MILL EQUIPMENT

28 to 35 with mill experience. Introduction New Equipment. Send resume. Address Box 57-150 care Paper Trade Journal.

JI-1

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to

Personnel Manager
West Virginia Pulp & Paper Company
Luke, Maryland J-1

Pennsylvania kraft mill seeks graduate chemical engineer for position of technical assistant to pulp mill superintendent. Candidates should have a minimum of one year experience in kraft mill operation. Formal training in pulp and paper technology helpful but not essential. Include details of education, experience and salary requirements in first letter. All replies confidential. Address Box 57-175, Paper Trade Journal. J-8

TECHNICAL SERVICE REPRESENTATIVE

Established, reputable New England firm has opportunity for man with broad paper mill experience to become Technical Service Representative. This man will act as consultant to our inside staff and our field Sales Engineers. His travel will take him all over the country—but he needn't be away from home base for extended periods.

The ideal man will be steeped in technical knowledge and be personable so that his recommendations will be believed and accepted.

We can teach the right man what he needs to know about our business if he has the proper paper mill background.

Send us a resume of your experience and past earnings. All will be held in strict confidence.

Box 51-170 care Paper Trade Journal
J-8

"WANTED"

MASTER MECHANIC, FOR TWO MACHINE BOARD MILL IN NORTHERN NEW JERSEY. IN REPLY STATE AGE, EXPERIENCE, PREVIOUS RECORD OF EMPLOYMENT.

ALL REPLIES HELD CONFIDENTIAL. ADDRESS BOX 57-107 CARE OF PAPER TRADE JOURNAL.
TF

Help Wanted

WANTED

Master Mechanic for two-machine Fourdrinier Mill in Central Illinois. Good salary and working conditions. In reply, state age, experience, and previous record of employment.

Address Box 57-165 care Paper Trade Journal. TF

PROJECT ENGINEER

Challenging and responsible position for individual with degree in mechanical, civil or chemical engineering with at least five years experience in pulp and paper or similar industrial fields. Position is at our International Falls, Minnesota, location. Salary open. Your reply will be kept confidential and should include personal, educational, and work history together with salary thinking.

Write Don Lindert, Industrial Relations Dept., Minnesota & Ontario Paper Company, 500 Investors Bldg., Mpls. 2, Minnesota. J-8

"**Wanted** — Chemical Engineer for a responsible position in the Container Testing Division of an expanding organization in the Toronto area. Some experience in the Pulp and Paper Industry is desirable but not essential. Duties to include materials control, container performance testing and development investigations along with ability to develop good customer relations. Excellent opportunity for an early advancement to a supervisory position. Submit resumé of qualifications, availability, salary requirements and a recent photograph to Box 57-171, care Paper Trade Journal."

J-1

MECHANICAL ENGINEER

with machine design background to assume charge of design and coordinate construction of paper and film processing machinery for leading multi-plant organization in the reproduction paper sensitizing field located in N.Y. area. Experience with web handling, coating or printing equipment desirable. Box 57-172 care Paper Trade Journal. J-8

SALES OPPORTUNITY—Large paper converter has immediate openings in New York City and environs for a sales trainee and a salesman experienced in coated paper and flexible packaging materials, both to be under 30 years of age. Position offers excellent opportunity for advancement leading to Sales Manager. Send resume giving complete information to Box 57-167 care Paper Trade Journal. J-1

Situations Wanted

EXECUTIVE-WORKS MANAGER — Superior record in production organization, labor relations and development of new products in boards, papers and conversion. Seeking organization offering challenging opportunity. Diversified lines Employed. Address Box 57-78 care Paper Trade Journal. J-29

SHIPPING SUPERINTENDENT 28 years experience shipping Kraft paper in rolls and sheets. Multiwall and grocery bags. Available after June 15. References. Address Box 57-147 care Paper Trade Journal. J-8

YOUNG MAN desires position with a firm having need for an Executive. Have 10 years experience in the paper field and allied industries. Address Box 57-169 care Paper Trade Journal. J-1

BARGAINS

IMMEDIATE DELIVERY

1—145" Holyoke—9 roll Super Calender Stack.

1—66" Holyoke—9 roll Super Calender Stack.

1—80" Pusey & Jones—11 roll Calender Stack.

1—30" x 160" Farrel-Birmingham Roll Grinder. Factory rebuilt in 1954 at a cost of $18,500.00. New drives and latest type of equipment.

27—48" x 110" Bagley & Sewall Dryers.

21—48" x 82" Pusey & Jones Dryers.

6—48" x 88" Bagley & Sewall After Dryers.

1—120" Pusey & Jones 2-Drum Winder. Anti Friction Bearings.

1—110" Pusey & Jones 2-Drum Winder. Anti Friction Bearings.

7—14 Plate Impco Flat Screens, Bronze Vats, latest type, direct motor drives, S.S. Plates.

1—Waxing Machine, complete with Vilter Refrigeration Equipment and Drives.

1—Hamblet Roller Bearing Cutter—30 roll backstand. Serial No. 2282, Model 28, Fully Equipped.

1—Hamblet Layboy, Serial No. 1140, Fully Equipped.

1—Continuous Feed Metal Edging Machine. (New)

1—Brightwood Box Machine, 6" Model Automatic Rotary Feed, End Shredder (60 per minute), Complete.

1—Hudson Sharpe Wax Paper Converter, Serial No. 1507, Fully Equipped, trim 72".

1—84" Kamyr Machine Complete, 75 Ton per day.

1—25" Dia. x 156" Suction Couch Roll.

2—22" Dia. x 156" Rubber Covered Press Rolls.

2—84" Bagley & Sewall Wet Machines.

1—No. 2 Jones Pulper, Anti Friction Bearings. Spare Worm.

1—Cowls Hydrasiusher Model 10 SD.

1—90 H.P. Terry Turbine. Type G-4000/1000 RPM. For Paper Machine Drive. Complete.

1—74" x 32" Saveall, complete with rubber suction couch.

1—8' x 10' Oliver Vacuum Filter.

2—Impco Pulp Screens.

2—No. 3 Impco Knotter Screens—S.S. Plates.

3—100 KVA Wagner Transformers, 4600-460.

1—24" x 6' Lodge & Shipley Geared Head, Heavy Duty Machine Lathe, Taper Attachment, Hollow Spindle, Motorized.

1—16" Steptoe Shaper—Motorized.

1—B & S No. 2 Surface Grinder—Motorized. Gear Reducers, P.I.V. Drives, Gearmotors, B.B. Pumps, Etc. 1000 Electric Motors from ¼ H.P. to 600 H.P. in Stock.

The above is but a small part of the inventory we carry. We can furnish you with almost anything in the line of paper mill, electrical and machine shop equipment.

We also have a large inventory of new and used flanged fittings at all types at very low prices.

Write—Wire—Phone For Your Needs

RUDERMAN MACHINERY EXCHANGE

GOUVERNEUR, NEW YORK

Telephone 333-334

TF

Situations Wanted

TECHNICAL DIRECTOR (EMPLOYED)
READY TO STEP UP

SPECIALTY PAPERS—PULP—
GRAVURE, FLEXO PRINTING—
LACQUER COATINGS—BAGS

TO ORGANIZE TECHNICAL DEPARTMENT — WORK CLOSELY WITH SALES, IN DEVELOPMENT AND IN CUSTOMER CONTACT—AND BE A CANDIDATE FOR FUTURE MANAGEMENT. ARE YOU A COMPANY DETERMINED TO GROW? ADDRESS 57-151 CARE PAPER TRADE JOURNAL.

J-1

Wanted

WANTED
Job Lots of Paper & Paperboard

We need a substantial supply of odd lots, side rolls, obsolete, surplus, or damaged lots of paper. Will buy all grades, any quantity. MELROSE PAPER CO., INC., 208 Walnut St., Philadelphia 6, Pa. Market 7-0800.

TF

USE
GENUINE
PARTS AND SERVICE
ON
ALL
SMITH & WINCHESTER
EQUIPMENT

The Smith & Winchester Mfg. Co.
South Windham, Conn.

J-1

For Sale

FOR SALE

1—136" Fourdrinier machine with suction couch, suction press, 41 dryers, 48" diameter double deck, 8 roll calender stack, pope type reel, Cameron winder, inclosed spiral gear drives. Fully rebuilt.

1—86" Fourdrinier machine. Suction couch, two presses, 1 suction if desired, 21 dryers 48" diameter, double deck frames, 7 roll calender stack, reel, 2 drum slitter and winder, complete Syco drive used less than 2 years.

1—76" Fourdrinier machine. 2 presses, 27 dryers 36" diameter, 2 calender stacks, Cameron winder, open drives. Here is a good little machine available at low price.

1—84" cylinder paper machine. One suction and one plain press, smoothing rolls, 24 dryers, 2 stack calenders, reels, winder, complete drive and all accessories.

Several other machines available.
Watch our ads.

OSBORNE PAPER MILL EQUIPMENT CORP.
Fulton, New York Tel. 2-4254
J-15

FOR SALE

38" Dexter Power Cutter.
44" National Automatic Clamp Power Cutter.
54" Seybold Cutter.
34" Challenge Diamond Power Cutter.
44", 54", 62" Hamblet Sheeters.
Layboys & Backstands.
42" and 62" Cameron Slitters.
36" Waldron 2-drum Reel.

and many other items

Thomas W. Hall Co.,
Stamford, Conn.

For Sale

FOR SALE
COMPLETE PAPER MILL

84" Downingtown Machine
3 Cylinder Moulds
Stainless Steel Piping
New Stickle Dryer Drainage System and Tension Roll Steam Control
New Sandy Hill Breaker Stack
Two Calender Stacks
Rope Cooking and Beating Equipment

THIS MILL HAS BEEN MAKING ROPE AND KRAFT SPECIALTIES.

THE THOMAS PHILLIPS CO.
AKRON 8, OHIO J-22

FOR SALE: We have the following 30# MG white kraft paper, 30" dia. jumbo rolls at mill prices or we will convert into a plain or printed bag for you.

Width	No. of rolls	approx. weight lbs.
7⅛"	9	1,286
7½"	65	9,923
10⅝"	35	7,612
11⅝"	33	7,898
12"	34	8,084
12⅛"	4	938
12⅝"	33	7,800
16⅝"	20	6,326

Noiseless Popcorn bag paper—11⅝" 12⅛"
Bleached dry wax 20/24#—9"
Box #57-173 care Paper Trade Journal

J-1

Sales Representation

Sales Representation

Sales Representation

TO PULP PRODUCERS
THE EXPORT MARKET FOR PULP IS OF INTEREST TO YOU

An old established and energetic British firm, in close contact with the main consumers of Sulphite and Sulphate Pulp seeks Agency for sale of North American Pulps. Excellent references and full details available. Apply: Box 57-145 care Paper Trade Journal.

J-15 N.C.

L O O K

THROUGH THE COLUMNS OF THE CLEARING HOUSE YOU ARE BOUND TO SEE WHAT YOU NEED.

J. E. SIRRINE CO.
Greenville, South Carolina
Engineers
Established 1902

PAPER & PULP MILLS • WASTE DISPOSAL • TEXTILE MILLS • APPRAISALS • WATER PLANS • STEAM UTILIZATION • STEAM POWER PLANTS • HYDRO-ELECTRIC • REPORTS

INDEX TO ADVERTISERS

A

Abbey Paper Stock Co. 49
Acme Steel Company ..... —
Adell Chemical Co. ..... —
Albany Felt Co. 46
Alleghany Instrument Co. ..... —
Allegheny Ludlum Steel Corp. —
Allied Chemical & Dye Corp. .. —
Allis Chalmers Mfg. Co. ..... —
Aluminum Co. of America ..... —
Aluminium Ltd. Sales, Inc. ... —
American Bitumuls & Asphalt Co. ..... —
American Cyanamid Co., Dyes Dept. ..... —
American Cyanamid Co., Paper Chemicals Dept. ..... —
American Cyanamid Co., Organic Dept. 30
American Defibrator, Inc. ... —
American Industrial Clays ... —
American Potash & Chem. Corp. —
American S. F. Products ..... —
American Steel & Wire Co. ... —
Annin Co. ..... —
Antara Chemicals, Sales Div. Gen. Aniline & Film Corp. .. —
Apmew, Inc. ..... —
Appleton Machine Co., The ... —
Appleton Wire Works ..... —
Appleton Wood Products Co. .. —
Armco Drainage & Metal Products ..... —
Armco Steel Corp. ..... —
Armstrong Machine Works ... —
Asten-Hill Mfg. Co. ..... —

B

Babcock & Wilcox Co. ..... —
Bahr Bros. Mfg. Co. 52
Bailey Meter Co. ..... —
Baltimore & Ohio R.R. ..... —
Bauer Bros. Co. ..... —
Becco Chemical Div. Food Machy. & Chem. Corp. —
Beloit Iron Works Co. ..... —
Bird Machine Co. 19
Bixby, R. W., Inc. ..... —
Black-Clawson Co. 31
Blaw-Knox Company ..... —
Boler Petroleum Co. ..... —
Bolton & Sons, Inc. 52
Borden Co. ..... —
Bowsher Co., N. P. ..... —
Brandon Sales, Inc. ..... —
Bristol Company ..... —
Brown Co. ..... —
Brown & Root, Inc. ..... —
Buckeye Cellulose Corp. ..... —
Buell Engineering Co. ..... —
Buffalo Forge Co. ..... —
Buffalo Pumps, Inc. ..... —

C

Cady, E. J., & Co. ..... —
Calgon Company ..... —
Cambridge Instrument Co. ..... —
Cameron Machine Co. ..... —
Carthage Machine Co. ..... —
Cascade Mfg. Co. ..... —
Central National Corp. Front Cover
Ciba Company ..... —
Cities Service Oil Co. ..... —
Clark-Aiken Company ..... —
Classified Advertising 54
Clearing House 54
Columbia Cellulose Co. ..... —
Columbia-Geneva Steel Div. U. S. Steel Corp. ..... —
Columbia-Southern Chem. Corp. Sub. of Pittsburgh Plate Glass Co. 7
Combustion Engrg. Co. ..... —
Corn Products Sales Co. 21
Crane Co. 10
Crucible Steel Corp. of America —
Curtiss-Wright Corp. ..... —

D

Davis, Frank H., Co. ..... —
Day, J. H., Company ..... —
DeZurik Shower Co. ..... —
Diamond Alkali Co. ..... —
Dicalite Div., Great Lakes Carbon Corp. ..... —
Dierks Paper Co. ..... —
Dilts Machine Works 31
Dodge Mfg. Co. ..... —
Dorr-Oliver ..... —
Dow Chemical Co. ..... —
Dow Corning Corp. ..... —
Dowell, Inc. 2
Draper Bros. Co. ..... —
Dryden Paper Co., Ltd. ..... —
du Pont E. I. de Nemours & Co. Dyestuffs Dept. 22
du Pont E. I. de Nemours & Co. Electrochemical Dept. ..... —
du Pont, E. I. de Nemours & Co., Pigments Dept. ..... —

E

East Texas Pulp & Paper Co. .. —
Eaton Manufacturing Co. ..... —
Ebasco Services, Inc. 53
Egan, Frank W., & Co. ..... —
Eichleay Corp. ..... —
Elixman Paper Core Co. ..... —
Elliott Company ..... —
Elwell Parker Elec. Co. ..... —
English China Clays Sales Corp. —
Extremultus, Inc. 48

F

Fairbanks, Morse & Co. ..... —
Falk Corporation ..... —
Farrel-Birmingham Co., Inc. .. —
Ferguson, H. K., Co. ..... —
Fibre Making Processes ..... —
Firestone Tire & Rubber Co. .. —
Fitchburg Screen Plate Co. .. —
Foxboro Co. ..... —
Frederick Iron & Steel Co. ..... —

G

Gates Rubber Company ..... —
Garlock Packing Co. 23
Geigy Dyestuffs Div., Geigy Chemicals Corp. ..... —
General Dyestuffs Co. ..... —
General Electric Co. ..... —
Gibbs-Brower Co. ..... —
Gilbert & Nash Co. ..... —
Glidden Company ..... —
Goodrich Chemical Co. 3
Goodrich Industrial Products Co. —
Goodyear Tire & Rubber Co. —
Gottesman & Co. ..... Front Cover
Graver Tank & Mfg. Co. ..... —
Grinnell Co., The 4
Gulf Oil Corporation ..... —
Gulf States Paper Corp. ..... —
Gurley, W. & L. E. ..... —

H

Hagan Corp. ..... —
Hall, Thomas W., Inc. 57
Hamblet Machine Co. ..... —
Harbison Walker Refractories. . —
Hart Moisture Meters ..... —
Hendrick Mfg. Co. ..... —
Hercules Powder Co. ..Back Cover
Heyden Chemical Co. ..... —
Homestead Valve Mfg. Co. ..... —
Hooker Electrochemical Co. ... 45
Huber, J. M., Corp. 9
Hudson Sharp Machine Co. ..... —
Hungerford & Terry, Inc. ..... —
Huyck, F. C., & Sons ..... —

I

Improved Machinery, Inc. ..... —
Infilco, Inc. 41
International Wire Works ... —
Isotope Products ..... —

J

Jefferson Chem. Co. ..... —
Jenkins Brothers ..... —
Jenkins, M. W., Inc. 52
Johns-Manville Corp. ..... —
Johnson Corp., The ..... —
Johnson, Alvin H., & Co. ..... —
Jones, E. D., & Sons Co. 42

K

Kalamazoo Tank & Silo Co. ... —
Kidder Press Co. ..... —
Knox Woolen Co. ..... —
Koppers Company ..... —

L

Langston, Samuel M., Co. .... —
Link-Belt Co. ..... —
Lobdell United Co. ..... —
Lockwood Greene 50
Lodding Engineering Co. .... —
Lukens Steel Co. 12
Lummus Company ..... —
Lunkenheimer Co. 59
Lyddon & Co. ..... —

M

Magnus Metal Co. 52
Magnaflux Corp. ..... —
Magnuson Products Corp. ..... —
Main, Charles T., Inc. 50
Manchester Machine Co. 29
Marathon Elec. Motor Corp. ... —
Mead Pulp Sales, Inc. ..... —
Merrick Scale Co. ..... —
Metallizing Engrg. Co. ..... —
Milton Roy Company ..... —
Minerals & Chem. Corp. ..... —
Minneapolis-Honeywell Reg. Co. —
Monsanto Chemical Co., Plastics Div. ..... —
Moore & White Co. ..... —
Morden Machines Co. ..... —
Murray, D. J., Mfg. Co. ..... —

N

Nash Engineering Co. ..... —
National Aluminate Co. ..... —
National Starch Products, Inc. —
National Tube Div., U. S. Steel Corp. ..... —
New Jersey Zinc Co. ..... —
Nichols Engrg. & Research Corp. —
Nopco Chemical Co. ..... —
Northeastern Paper Sales, Inc. —
Norton Co. ..... —
Noodex Products Co. ..... —

O

Oakite Products, Inc. ..... —
Ohio Injector Co. ..... —
Olin Mathieson Chem. Corp. .. —
Osborne Paper Mill Equip. Corp. 57

P

Paper Converting Machine Co. —
Parsons & Whittemore ..... —
Patterson Fdy. & Mch. Co. .. —
Patton Mfg. Co. ..... —
Penick & Ford, Ltd. ..... —
Perkins, B. F., & Sons, Inc. .. —
Perkins Goodwin Co. ..... —
Personnel Service Associates .. 54
Pioneer Paper Stock Co. ..... —
Pittsburgh Piping & Equip. ... —
Pittsburgh Plate Glass Co. ... —
Poirer Control Co. 51
Potdevin Machine Co. ..... —
Powell Valves ..... —
Pratt Co., Henry ..... —
Price & Pierce, Ltd. 52
Pusey & Jones Corp. ..... —

R

Railway Supply & Mfg. Co. ... —
Raymond, Chas. P., Service, Inc. 54
Rayonier Inc. ..... —
Ready-Power Co. ..... —
Record Fdy. & Mch. Co. ..... —
Red Ray Mfg. Co. ..... —
Reliance Elec. & Engrg. Co. ... —
Rem-Cru Titanium Inc. 43
Restigouche Corp. ..... —
Rice Barton Corp. ..... —
Riedel, Gus & Son ..... —
Riegel Paper Corp. ..... —
Rogers, Sam'l. C., & Co. ..... —
Rohm & Haas Co. ..... —
Ronningen-Petter Co. ..... —
Roosevelt Paper Co. ..... —
Ross, J. J., Co. 55
Ross, I. O. Engineering Co. .. —
Ross-Midwest Fulton Co. .... —
Ross Paper Machinery Co. .. —
Ruderman Machy. Exchange .. 56
Rust Engineering Co. ..... —

S

Sandoz Chemical Works ..... —
Sandy Hill Iron & Brass Works —
Saran Lined Pipe Co. ..... —
Scapa Dryers, Inc. ..... —
Seaboard Air Line R. R. Co. —
Shartle Bros. Machine Co. 31
Shell Chemical Corp. ..... —
Shuler & Benninghofen ..... —
Sigmamotor Inc. ..... —
Signode Steel Strapping Co. ... —
Sirrine, J. E., Co. 57
Smidth, F. L. & Co. ..... —
Socony, Mobiloil ..... —
Soderhamn Mch. Mfg. Co. .... —
Sonoco Products Co. ..... —
Southworth Machine Co. 14
Spraying Systems Co. ..... —
Stadler-Hurter & Co. 50
Stebbins Engrg. Co. 6
Stein, Hall & Co. ..... —
Stevens, Charles R. Inc. ..... —
Stone & Webster Engrg. Corp. —
Stowe-Woodward, Inc. ..... —
Sturtevant Div., Westinghouse Elec. Corp. ..... —
Sunday, Geo. M., & Assoc. 54
Sutherland Refiner Co. ..... —
Swenson Evaporator Co. ..... —
Swepco Tube Corp. ..... —

T

Taylor Instrument Co.'s ..... —
Taylor Stiles & Co. 52
Tennessee Coal & Iron Co. .... —
Tennessee Corp. 46
Testing Machines ..... —
Texas Co. ..... —
Texas Gulf Sulphur Co. ..... —
Thiele Kaolin Co. ..... —
Thomas Paper Stock Co. 53
Timken Roller Bearing Co. .... —
Titanium Pigment Corp. 13
Torrington Co. ..... —
Towmotor Corp. ..... —
Tracerlab Inc. ..... —
Trent Tube Co. ..... —
Turner Halsey Co. ..... —
Tyer Rubber Co. ..... —

U

United Carbon Co., Inc. ..... —
United Engrg. & Fdy. Co. .... —
United Paper Machinery Corp. —
U. S. Industrial Chem. Co., Div of National Distillers & Chem. Corp. ..... —
U. S. Rubber Company ..... —
United States Steel Export Co. ..... —
United States Steel Supply Co. ..... —
U. S. Steel Corp. ..... —

V

Valley Mfg. Co. ..... —
Valley Iron Works 8
Vanderbilt, R. T., Co. ..... —
Viking Instruments, Inc. ..... —
Virginia Smelting Co. ..... —

W

Waldron, John, Corp. ..... —
Wallace & Tiernan Inc. ..... —
Walworth Co. ..... —
Weber, H. G., & Co. ..... —
Webster Mfg. Co. ..... —
West End Chemical Div., Stauffer Chem Div. ..... —
Westinghouse Elec. Corp. ..... —
West Virginia Pulp & Paper Co. 53
Weyerhaeuser Timber Co. .... —
Whitney Corp. ..... —
Wiggins Teape & Alex Pirie. .. —
Williams Apparatus Co., Inc. —
Williams-Gray Co. ..... —
Wisconsin Wire Works ..... —
Wolverine Equipt. Co. ..... —
Woodpulp, Inc. 47
Worthington Corp. ..... —
Wyandotte Chem. Corp. ..... —
Wyatt Metal & Boiler Works —

Y

Yale & Towne Mfg. Co. ..... —
Yarnall-Waring Co. ..... —

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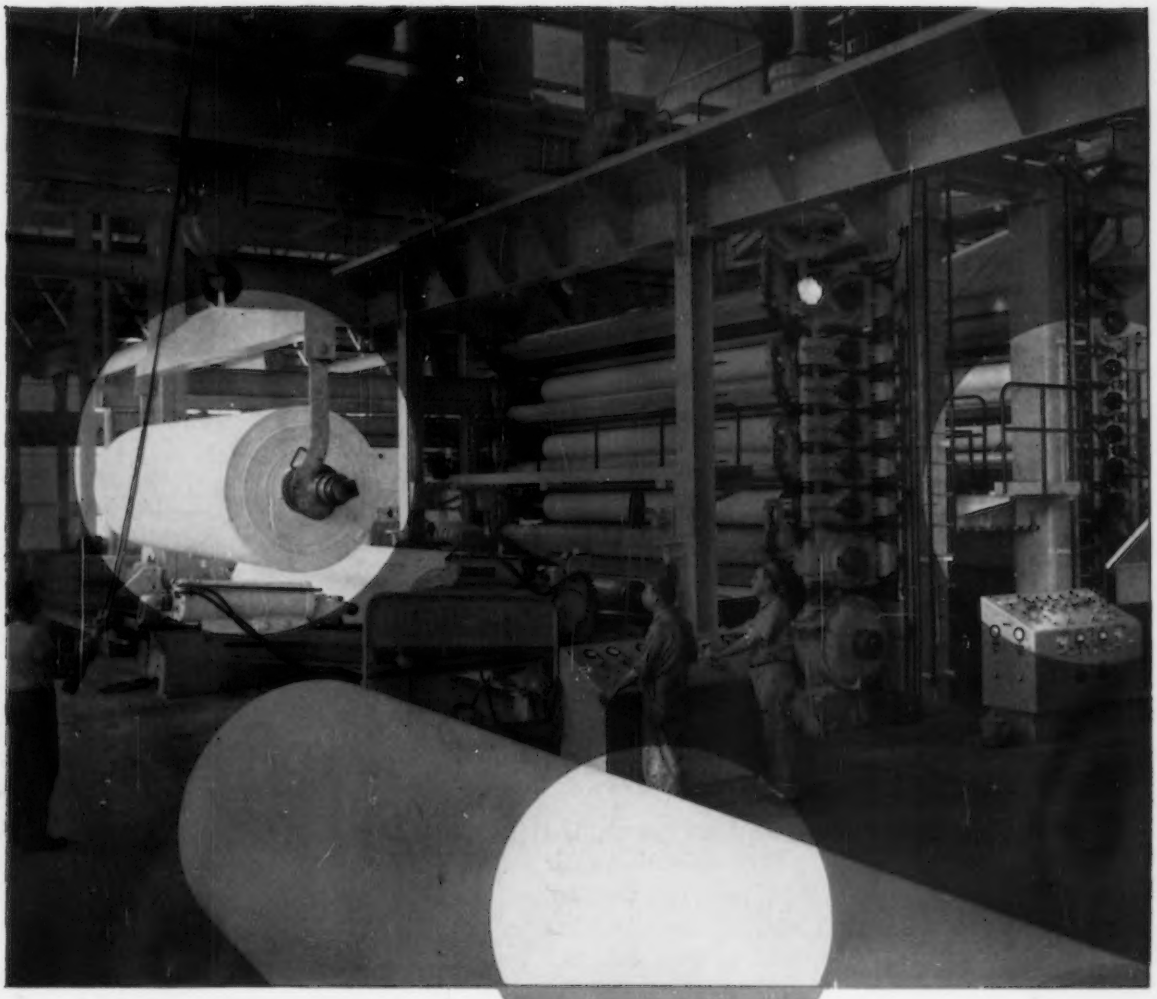

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